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Final Technical Report

Contract Number 66-01-0000000000

The Office of Naval Research

University of Southern California

Los Angeles, California

1966

Factors Influencing Organizational Effectiveness

A Final Report

by

A. L. Comrey, J. M. Pfiffner, and W. S. High

Final Technical Report

Contract N6-ONR-23815

The Office of Naval Research

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Preface

The research to be summarized in this final report was conducted under contract N6 onr 23815 between the Office of Naval Research and the University of Southern California. The project began September 1, 1950 and continued until September 1, 1954. The personnel associated with the project and their contributions were as follows:

John M. Pfiffner, Professor of Public Administration, University of Southern California, was the principal investigator and director of the project from 1950 to 1954. He had administrative responsibility for the project and participated in all research planning activities.

J. P. Guilford, Professor of Psychology, University of Southern California, was co-responsible investigator from 1950 to 1954. He suggested the original research plan and acted as technical advisor.

H. J. Locke, Professor of Sociology, University of Southern California, was co-responsible investigator from 1950 to 1954 and served in an advisory capacity.

Andrew L. Comrey, Assistant Professor of Psychology, University of California at Los Angeles, served as project supervisor from 1950 to 1951 and as a consultant from 1951 to 1954. He had direct responsibility for validation studies 1, 2, 5, 6, 7, and 8.

R. C. Wilson, Associate Professor of Psychology, Reed College, was project supervisor from 1951 to 1953. He had direct responsibility for validation studies 3 and 4.

Wallace S. High, Project Supervisor, was associated with the project from 1951 to 1953 as a research assistant and from 1953 to 1954 as project supervisor. He assisted in all phases of the research during his tenure.

Helen P. Beem, Research Assistant in Sociology, University of California at Los Angeles, served as a research assistant from 1949 to 1952 and as a research associate from 1952 to 1953. She participated in all phases of the research during her tenure.

Lisbeth L. Goldberg, research assistant from 1953 to 1954, was responsible for the statistical computation during her association with the project. Other persons who have contributed statistical and clerical aid to the project include: William Probert, Joan Lovell, Frances Berger, and Gerald Anchor.

Many other persons besides those who worked as members of the immediate staff have aided this research materially. Some of those who merit particular mention are: Donald R. Ball, Jack Kern, and N. F. Spangenberg of the U. S. Forest Service; W. P. Taber, F. C. Geer, R. S. Putnam, H. G. Snodgrass, and Don Shively of the San Diego Naval Air Station; J. Wesley Johnson of the Long Beach Naval Shipyard; Thomas C. Campbell, Robert S. Clay, and Don Heryford of the California State Department of Employment; Karl Kunze and H. W. Bissell of Lockheed Aircraft Corporation; Emery E. Olson and Henry Reining, Jr. of the

University of Southern California.

This project had its early beginnings in a Carnegie Corporation grant to the three responsible investigators to hold an interdisciplinary seminar for the purpose of exploring the topic of informal organization. Results of the seminar's work made it evident that the group could not agree upon precise standards for differentiating formal and informal organization. For this reason, the objective was broadened to include the study of organizational effectiveness. A research plan was evolved and funds obtained from the Office of Naval Research to pursue the research.

The report will be organized into four chapters. Chapter I is concerned mainly with the research procedures which were employed in carrying out each of the studies completed under the project. Attention is called to those changes in method which developed as the project progressed, both in the manner of conducting validation studies and in the methods for developing measurement techniques. Criterion problems are discussed. The advantages to be gained from employing a critical incident analysis in this type of research should also be noted.

Chapter II summarizes the results of all studies which met specified criteria of statistical significance. The variables concerned are presented as groups of questionnaire items, or dimensions, for which validity evidence is given. These dimensions are grouped into three categories: supervisor self evaluations, situational evaluations, and supervisor evaluations.

Chapter III is devoted to presenting the interrelationships among dimensions for which validity evidence is given in Chapter II. The dimensions developed during the course of the project were subjected to iterative item analysis procedures (17) to weed out poor items and to decrease the inter-correlations among dimensions. Correlations among dimensions surviving this item analysis technique are shown for three different samples. Factor analysis results are given for two of these correlation matrices.

Chapter IV will be devoted to describing the implications of our research results and how they may be used by management. The first three sections of the chapter will be devoted to prose descriptions of "good organizational behavior" and the last section will treat the use of these results in practice.

CHAPTER I

Experimental Procedures

The problem concerning this research project was that of determining some of the factors which are related to criteria of organizational effectiveness. The research has been carried out in three main stages: (a) development of hypotheses and instruments for measuring variables related to organizational effectiveness; (b) administration of these instruments in a series of organizations for which criterion data on organizational effectiveness could be obtained; and (c) correlation of variables with the measures of organizational effectiveness. This broad problem with its accompanying general design of exploration has guided project research from the beginning.

Eight validation studies have been completed under this contract as of this time. Certain item analysis procedures were introduced early to improve the questionnaires used in the validation studies. Thus, the two main kinds of studies undertaken have been in the area of questionnaire validation and questionnaire refinement. The first section of this chapter will be devoted to a brief description of the procedures used in each of the validation studies undertaken up to the time of this writing. The second section of the chapter will fulfill a similar function for those studies aimed at improving questionnaires used in validation studies. The third and final section will deal with general matters of procedure in validation studies of the kind undertaken in this research.

Each study mentioned will be designated by an identifying symbol composed of the letter V or Q followed by a numeral. Thus, "V1" would designate the first validation study and "Q2" would designate the second study designed to improve the questionnaires. Throughout the remainder of the report, individual studies will be referred to by this symbolism to save space:

- V1 The U. S. Forest Survey (2, 3)
- V2 The Department of Employment Survey (4)
- V3 The Survey of Skilled Tradesmen (18)
- V4 The Survey of Supervisors and Workers (22)
- V5 The Survey of District Rangers (5)
- V6 The Survey of Aircraft Workers (6)
- V7 The Survey of Aircraft Supervisors (7)
- V8 The Survey of Aircraft Foremen (11)

- Q1 A Factor-Analytic Study of Supervisory and Group Behavior (19)
- Q2 An Empirical Check on a Short Method of Factor Analysis (20)
- Q3 An Iterative Analysis of Supervisory and Group Dimensions (21)
- Q4 Factored Dimensions of Organizational Behavior. I. Field Service Workers (8)
- Q5 Factored Dimensions of Organizational Behavior. II. Aircraft Workers (12)
- Q6 Dimensions of Organizational Behavior (13)

The purpose of this chapter is to give a general impression of the methods

employed in executing the research undertaken on this project. No attempt has been made to describe completely the procedure for each and every study. The reader is referred to the individual technical reports or publications for more details.

Validation Studies

V1. The U.S. Forest Survey. A different questionnaire was mailed to personnel in each of six organizational levels of 18 U.S. Forests in California. The distribution of respondents among these levels was: 17 forest supervisors, 36 top line-staff men, 36 technical-staff men, 89 district rangers, 182 field service workers, and 53 clerical workers. District rangers and field service workers were divided, each half receiving a different questionnaire, so that eight questionnaires in all were used.

Questionnaires were composed of objective items related to the respondents' attitudes toward their work, the forest service, their supervisors, their subordinates, and their coworkers. Each item was conceived separately and included with the supposition that it might correlate with some criterion of organizational effectiveness. The items were made up on the basis of information from previous research, organization theory, conferences with executives, and from our own staff ideas.

In order to obtain criterion measures, eight qualified persons in the San Francisco Regional Office of the U.S. Forest Service were asked to provide independent rankings of the 18 forests on the basis of how well a forest was functioning in comparison with what it ought to be doing. The intention was to make allowances for unfavorable local conditions which might affect adversely a forest's absolute performance but which lay beyond the control of the managerial staff. Good agreement existed among these independent rankings, so one overall composite ranking of the 18 forests was used as the criterion. For purposes of statistical analysis, the forests were divided into three groups of six on the basis of the composite rankings, "high," "medium," and "low."

After the returns were in, constituting 92 percent of those mailed out, the items in the various questionnaires were classified for the purpose of combining them into pools so that a single item group score could be obtained rather than dealing with an unreliable single item response. This step was carried out on the basis of staff judgment regarding the item content and its probable import to the respondent. After each questionnaire had been segmented into various groups of similar items, called "dimensions," total scores were obtained by dimension for each questionnaire separately. The dimensions naturally were somewhat different from one questionnaire to another, although there was some overlap in kinds of items. The total scores were obtained through appropriate weighting of response categories to the various questions. Thus, for each item group, a name was given to express the common content of the items and responses to the item were given a weight along the dimension implied by the name. Questions were generally five choice, with assigned weights of 0, 1, 2, 3, and 4 for the various choices when all response categories were employed. The answer at one end represented a low degree of the dimension, receiving a "0" weight, and the answer at the other end represented a high

degree of the dimension. This choice received the weight of "4."

Except for the forest supervisor group, more than one respondent was generally heard from in each forest. In obtaining scores for a forest on each dimension, all persons at the particular level who replied from this forest were averaged. Thus, 18 scores were obtained for every dimension in every questionnaire. The analysis was based on the forest as the individual case. Approximately 20 dimensions were analyzed for each of eight questionnaires. The method of analysis consisted of investigating the regression of the dimension scores on forest criterion scores. For this purpose, criterion group average dimension scores were computed separately for the forests in the "high," "medium," and "low," criterion groups. To investigate the relationship between dimensions and the criterion, epsilon coefficients (15) were computed, using the more conservative correction for a rectangular criterion distribution prior to testing for significance. This statistic gives a measure of correlation between dimension and criterion without assuming a linear regression; epsilon proved to be a happy choice in that some curvilinear relationships appeared which might well have been lost if a conventional linear correlational analysis had been employed, such as testing the difference between "high" and "low" groups.

For more specific details on this and other studies, the individual reports should be consulted. Only a general picture can be provided here.

V2. The Department of Employment Survey. The second study in the series was carried out in 30 offices of the California State Department of Employment in the Los Angeles area. The 30 offices were divided into four criterion groups of 7 "high," 8 "medium high," 9 "medium low" and 6 "low" offices on the basis of rankings by department officials. These ratings were made by five different assistant area managers under whom the 30 offices were divided for administrative purposes. The only available procedure constituted the grouping of the "high," "medium," and "low" groups from the separate assistant area managers, assuming the unlikely condition that no differences in mean and variance existed between offices under different assistant area managers.

Only three questionnaires were used in this study, one each for office managers, assistant office managers and supervisors, and non-supervisory personnel. Data were collected from 30, 35, and 66 persons, respectively, in the three groups during personal visits to the offices. The nonsupervisory personnel were of two distinct types, those engaged in unemployment insurance and those engaged in job placement. Analysis was carried out separately in these two groups. In other respects, the methods employed for this study were similar or identical to those used in study V1.

V3. A Survey of Skilled Tradesmen. Experience with the first two studies had shown that classifying items on an a priori basis was unsatisfactory as a method of obtaining dimensions. The actual content of the items was difficult to predict, some items could not be placed in any category, and a poor distribution of items among the various subject matter areas tended to occur. For this, and subsequent studies, therefore, items were made up to represent a particular dimension, each item representing merely a somewhat different question for the same variable. In this manner, it was hoped to obtain much more homogeneous item pools. The necessity of classifying was automatically

eliminated, and a standard number of items per dimension resulted.

The V3 survey was carried out in 33 basic production shops of the Overhaul and Repair Department of the Naval Air Station, San Diego. These 33 shops were divided into 14 "high," 12 "medium," and 7 "low" shops on the basis of a production criterion, determined in part by the extent to which production standards were realized. Standards had been established over a period of time for various kinds of overhaul and repair work and records showed that the shops varied considerably in the extent to which they met these standards. Using these production data, industrial management personnel and high-level production foremen reached a consensus judgment regarding the placement of the 33 shops into the described criterion categories. Judgment was supposed to have entered only to make allowances for known extenuating circumstances which would adversely affect a shop's showing on the production figures.

The questionnaires were composed of 13 dimensions, all items being objective and almost always five choice. Responses were scored "1" through "5" and total scores obtained on each dimension for 1,022 journeymen, or skilled tradesmen in the 33 shops. The questionnaires were administered on the job during a general work stoppage for this purpose. The shop supervisors and helpers also filled out different questionnaires. Findings for these groups were reported separately. A separate average score was obtained for each shop on each dimension and an epsilon coefficient analysis carried out as before to correlate the individual dimensions with the criterion of organizational effectiveness.

V4. A Survey of Supervisors and Workers. As mentioned above, questionnaires were also given to shop supervisors and helpers in the Naval Air Station research; the first part of this research is described above as study V3. The criterion employed was the same one used in the previous study, although the number of shops included was smaller because a few very small shops were eliminated. It was felt that the supervisors in those shops were not exercising a supervisory function in the same sense as that of supervisors with a sizeable number of subordinates. For the supervisors, then, the "high," "medium," and "low" groups contained 9, 10, and 5 shops. For the helpers, one additional shop was contained in the "medium" group. The total numbers of cases involved for the two analyses were 68 supervisors and 163 helpers. The numbers of dimensions involved were 10 for the supervisory questionnaire and eight for the helper questionnaire. The method of analysis was the same as before.

V5. A Survey of District Rangers. The first study in the U.S. Forest Study showed that ratings of whole organizations by higher level officials did not correlate well with questionnaire data taken from individuals several levels below the top of the organizations being rated. The decision was made therefore to undertake a new study in which criteria were taken directly at a lower level in the organization. Toward this end, a list of the established district rangers was given independently to five officials from the San Francisco Regional Office who had frequent contact with field personnel. Each rater was asked to rate on a five point scale only those rangers whom he felt qualified to evaluate. These ratings were to divide the evaluated rangers equally among the five categories and were to take into account how well the district rangers were performing their present overall function, allowing for difficulties under which they were operating. Sixty nine rangers were found who had at least two ratings and who had at least one permanent career employee.

Ratings were averaged to provide a single criterion score for each ranger. On the basis of these overall criterion scores, the 69 district rangers were divided into 16 "high," 24 "medium high," 18 "medium low" and 11 "low" rangers. Field service subordinates of these district rangers were also surveyed and given the same criterion group designation as their superiors.

In developing the questionnaires, dimensions from previous studies were naturally carried over, but a new technique was introduced in this study. Since few results had been obtained for district rangers in the first study, the decision was made to conduct a Flanagan critical incident study (9) of success and failure among district rangers to gain insight into the nature of the operating variables. Forest officials at various echelons, including district rangers, were requested to submit descriptions of actual incidents in which district rangers had done either a particularly good or particularly bad job. Hundreds of such incidents were eventually obtained. A study of these examples of success and failure provided many clues for dimensions which had not been covered in our previous questionnaires. Once an idea for a dimension was obtained, several objective and apparently homogeneous items were constructed to measure the new dimension.

Only one district ranger per district was surveyed, of course, but since there were 118 field service workers, many districts contributed two. The questionnaires were all mailed to the individuals concerned and returns represented 91 and 79 percent for the rangers and field service groups, respectively. Criterion identification was achieved by mailing colored questionnaires, using a different color for each criterion group. It was unfortunately impossible to pair ranger and field service workers from this technique, however, so no district average was taken; rather, the dimension averages were taken by total criterion group, using the number of field service respondents as the N instead of the number of districts involved. The remainder of the procedure was the same as that used in other studies.

V6. A Survey of Aircraft Workers. This and the two studies to follow were carried out at the Lockheed Aircraft Corporation, Burbank, California, on 29 production departments engaged in aircraft manufacture. Questionnaires were administered to 29 foremen, 244 supervisors, and 213 workers. Criterion data were the same for each study. Results for each questionnaire group have been presented in a separate study because of the extensive amount of data to be reported.

Four different criterion measures were employed for validation purposes. The first of these was the work-rework criterion, which represented a ratio of the number of production hours spent to the number of hours consumed in correcting production mistakes. Such data were available for all departments and resulted in four criterion groups, comprising seven "high," seven "medium high," seven "medium low," and eight "low" departments, respectively. A second criterion, acceptance rate, was based upon the number of production jobs accepted per 100 jobs inspected. The departments were divided again into four groups on the basis of these data, six "high," eight "medium high," seven "medium low," and seven "low" departments. The third criterion, production rate, represented the extent to which the departments accomplished what was expected of them on the basis of time standards, adjusted for extenuating factors affecting produc-

tion. The departments for which such data were available were divided into five "high," eight "medium high," nine "medium low," and five "low" departments. The fourth and final criterion was derived from overall effectiveness ratings by a company executive. The departments were supposed to be rated as a whole, taking into account adverse circumstances beyond the control of department personnel. Three criterion groups were formed, containing 10 "high," 10 "medium," and 9 "low" departments, respectively.

For each person, a score was obtained on each of 19 dimensions. These dimension scores were averaged for the workers within each department to get one dimension score for the department. These scores were combined in various ways according to the distribution of departments among the criterion groups in each criterion. The epsilon_c analysis was carried out separately for each criterion.

V7. A Survey of Aircraft Supervisors. This study was concerned with the results for the supervisory questionnaire in the Lockheed Aircraft Corporation research, part of which was treated in study V6. The same procedures were employed as for the workers.

V8. A Survey of Aircraft Foremen. The analysis of questionnaire responses of the 29 Lockheed foremen constituted the principal subject of this study. The methods of analysis employed were almost identical to those used in studies V6 and V7.

Questionnaire Studies

Q1. A Factor Analytic Study of Supervisory and Group Behavior. Conventional item analysis procedures were attempted for the purposes of improving questionnaires after each of the first two studies. These included such steps as throwing out items with low correlations with item pools, items with faulty structure, and so on. Some more effective procedure was deemed necessary, however, if the questionnaires dimensions were to attain the greatest possible homogeneity and independence. Thus, a special questionnaire study was planned to make refinements prior to the next validation study. A questionnaire was constructed which comprised 13 dimensions, each made up of from six to eight items. The questionnaire was administered to 98 civilian journeymen at the Long Beach Naval Shipyard. The 13 dimensions were further divided into odd and even items and a total score computed for each sub-dimension, giving 26 scores per person. One faulty subdimension was thrown out and the remaining 25 were factor analyzed by the complete centroid method (16). Nine factors were extracted and rotated to approximate simple structure. Seven of these nine factors were interpreted and two were left as residuals.

Q2. An Empirical Check on a Short Method of Factor Analysis. During the course of completing the analysis undertaken in study Q1, it became clear that the amount of time consumed made it somewhat impractical as a working method for the purposes at hand. Consequently, it was decided to attempt a modified diagonal method of analysis (20). The principal difficulty with the diagonal method as outlined by Thurstone is that the communality estimates employed become extremely crucial; errors here may have a drastic effect on the outcome. Since we were not particularly interested in analyzing the common factor variance, but rather

the total true variance, it appeared reasonable to use the more accurate reliability estimates for diagonal values (instead of guessed communalities) and proceed with the less time consuming analysis. This step was undertaken with the same correlation matrix as was used in study Q1. The results of the two analyses agreed rather well and much less time was required for the second method.

Q3. An Iterative Analysis of Supervisory and Group Dimensions. The shorter factor analytic procedure provided helpful information concerning the interrelationships among existing dimensions, but the problem of how to refine the individual dimensions through changing their item composition still remained unsolved. For this reason, a modified Wherry-Gaylord iterative item-analysis (17) was undertaken with the same data upon which studies Q1 and Q2 were based. Total scores were obtained for each person by summing dimension scores for those dimensions highly loaded on the factors obtained in study Q1. These were taken as factor scores. IBM answer sheets containing individual's responses were divided into five groups of 9, 20, 42, 20, and 9 percent on the basis of the total factor scores. Biserial correlations between individual items and the factor score were computed by Flanagan's shortcut method (10). This procedure was completed for each of seven item pools corresponding to seven factors from study Q1. A second item pool, which contained those items having high correlations with the factor itself but relatively low correlations with the other factors, was selected for each factor. Items overlapping two or more factors were thrown out altogether. New total factor scores were derived from the items selected for the second iterative step and the items correlated with these new sets of factor scores. The whole process was continued until the items which would be selected for the next iteration were the same ones which were used for the preceding iteration. In no case were more than three iterations required.

The process briefly described above resulted in final item pools or dimensions in which homogeneity had been considerably improved through dropping out items with low correlations with total dimension score. Furthermore, the degree of correlation between item pools had been reduced through the rejection of items which correlated highly with more than one pool. The end result of this method of analyzing the questionnaires seemed to be much superior to the methods utilized in studies Q1 and Q2 for the specific purposes of this project, namely, questionnaire refinement.

Q4. Factored Dimensions of Organizational Behavior, I. Field Service Workers. The success of the method in study Q3 warranted its routine use for any questionnaire for which significant results were obtained in a validation study. Such an analysis was therefore applied to the questionnaire responses for the field service questionnaire used in study V5. The iterative analysis undertaken in study Q3 provided several analyzed dimensions which appeared substantially intact in the field service questionnaire. These dimensions were used as a starting point in the new iterative analysis. Certain new dimensions were selected as likely candidates for new item pools, relatively independent of those established. These new selections were tried out and rejected or included as they did in fact prove their unique contribution through the statistical analysis. New dimensions were added in this manner until there was no group of related items whose major variance remained to be accounted for. After the final iterated factors had been determined, intercorrelations among them were obtained and a centroid factor analysis carried out. (See Chapter III)

Q5. Factored Dimensions of Organizational Behavior. II. Aircraft Workers.

An identical analysis to that in study Q6 was carried out for the questionnaire responses of 100 Lockheed hourly workers, taken from the cases used in study V6. Many of the same dimensions appeared in both this and study V5, so the present questionnaire study constituted a partial check on the stability of findings from study Q4. The general educational level was much higher among the cases used in study Q4, however, a fact which perhaps accounted for considerably higher reliability coefficients for the dimensions appearing in that questionnaire. It should be mentioned, perhaps, that a slightly different method was used for computing the biserial correlations in both studies Q4 and Q5. Flanagan's tables (10) were used for biserial correlations based upon the top and bottom 27 percent of the cases rather than a five category distribution, such as that employed in study Q3. Results from a factor analysis of these dimensions are given in Chapter III.

Q6. Dimensions of Organizational Behavior. Certain new dimensions were included in the questionnaire used in study V5, so an iterative analysis was thought desirable to provide refined item pools to cover those areas. The methods employed for this analysis were the same as that used in study Q5 except that no factor analysis was necessary because the dimension intercorrelations were low.

Comments on Experimental Procedures

During the course of these studies many modifications in technique were introduced as a result of experience. This section contains comments on many of the steps which might be involved in an "ideal" study of the general kind carried out by this research group. By "ideal," we do not mean "perfect" but merely that which our experience has suggested would be workable.

What Organizations to Study. The original project plan was to study a collection of autonomous organizations but preliminary research showed this to involve many practical difficulties. Perhaps the most annoying of these problems was that of obtaining criterion data which would be comparable from organization to organization. For this and other practical considerations, the original plan was revised in the direction of finding large organizations with many subunits. Organizations having relatively autonomous subunits would be considered as most desirable, other things being equal. Furthermore, organizations were sought which had good methods of evaluating the effectiveness of their subunits. Objective measures were to be favored wherever obtainable.

In selecting a large organization with subunits, the phenomena which are subject to study become somewhat limited. To the extent that the parent organization imposes uniformity on subunits, variance in certain variables is restricted or eliminated. The variable has little opportunity to show any validity. Thus, if the parent organization sets up highly standard procedures and organization structure, it is useless to attempt to validate variables in this area. Human relations variables are less subject to this kind of restriction, however, because most companies have not been as successful in regimenting supervisory behavior. It would seem, however, that more and more effort is being made in this direction.

Ideally, all subunits would be doing the same kind of work under the same general conditions. Practically, such a situation is seldom found. Sometimes it is impossible to obtain subunits doing the same kind of work and in other cases variations in conditions exist under which the subunits work. A forest, for example, may be located in an area where fires occur frequently because of weather conditions. Another may be located where personnel dislike the living conditions. No two situations are exactly the same but in every case, some steps should be taken to control for extraneous variables which would unfairly favor certain subunits over others. Sometimes this can be done only through a clinical judgment by raters presumed to be qualified. In other cases, engineered time standards, carefully adjusted for relevant variables, can be obtained.

In deciding what organizations to study, the quality of available criterion information is certainly of prime importance. The problems in this area are too well known to be discussed here, but it should perhaps be mentioned that organizations with objective criterion data are greatly to be preferred. Rating data can be obtained in such organizations, too, but the absence of good objective measures of effectiveness leaves the investigation at the mercy of rating reliability and validity. These are not always very high, unfortunately. Objective data often have their problems, particularly in the area of validity, but such difficulties can sometimes be met by making allowances for extenuating circumstances.

Critical Incident Analysis. When a modified Flanagan critical incident analysis (9) was undertaken prior to the study of district rangers (5), it became apparent that many valuable leads appeared which otherwise would have been neglected. The first forest study questionnaires did not include many of the variables which were later shown to be significant in the district ranger study. For those not familiar with Flanagan's procedure, the steps involved as applied to this purpose were roughly as follows: First, members of various levels of the organization to be studied were contacted, in person, if possible, and asked to recall instances in which someone did an especially good or an especially bad job. The emphasis was on accurate and specific accounts of the incident. After a large number of such incidents was obtained, a content analysis was performed. This amounted to a classification of the incidents into broad groups and a further breakdown into subheadings. This procedure provided such a valuable source of ideas for questionnaire dimensions that it is to be highly recommended.

Questionnaire Development and Refinement. Previous research, critical incident data, and other sources can be utilized for the purpose of determining what are the best variables to investigate in the particular case at hand. The present project has from the beginning favored items of the objective type. As developed in our studies, groups of homogeneous items, or dimensions, have been utilized to measure each variable hypothesized to have some relation to criterion measures of effectiveness. This is approached by attempting to construct several items which all measure the same variable although with different emphases in their wording.

Success in item writing is rarely complete, so each dimension developed should contain a sufficient number of items to allow for some attrition in the questionnaire refinement process. The procedures found to be the most successful in this respect for our purposes were finally decided upon rather late in the project. Basically, the favored procedure involves a special item analysis by

means of a modified Wherry-Gaylord iterative technique (17). Certain modifications of this procedure have been employed, the basic steps having already been described in the last section of this chapter. This procedure, as employed here, generally leaves the dimensions with a small number of relatively homogeneous items and with minimum correlations among the dimensions. This latter state is achieved primarily through elimination of items which show high overlapping variances with more than one dimension or item pool. Despite these steps, however, substantial correlations between the purified dimensions will often remain. The original Wherry-Gaylord technique suggests that the dimensions may be rotated to orthogonal positions, but we have preferred to keep the purified dimensions intact so that the items making up a particular dimension will have logical as well as statistical unity.

The fact that the dimensions remain correlated after this process is not necessarily to be considered a defect. In actuality, there is certainly no reason to suppose that important supervisory and group behavior traits will necessarily be uncorrelated. Many desirable personality traits go together and the correlations between dimensions will reflect this. The actual correlations found among dimensions will shift from one sample to another, depending, among other things, upon the reliability of questionnaire responses. This can and does vary markedly from one sample to another.

For purposes of further determining the factorial composition of dimensions with substantial intercorrelations, a supplementary centroid factor analysis (16) can be undertaken. This will help to reveal the essential structure underlying the purified dimensions and can be introduced at a point where the labor has been reduced by the prior elimination of items and dimensions showing too much overlap. As used here, the iterative procedure, then, can be viewed essentially as an item analysis device or means of purifying and improving the questionnaire dimensions. If further information is desired concerning the underlying structure, a standard factor analysis can be profitably employed.

Although it has not been done systematically in our studies to date, a desirable step would be to perform the special questionnaire refining iterative analysis on a pretest sample. The questionnaires could be revised on the basis of this work so that the final forms for the validation study would contain only those items which withstood the test of the prior statistical analysis. In this way, final validation statistics would apply directly to the refined dimensions. Our own studies have often merely used the iterative study results to refine the questionnaires for use in subsequent investigations. Where the number of respondents is large, a sample of 100 cases may be taken for the iterative analysis prior to validity analysis with the improved dimensions on the remaining cases.

Method of Analysis. Statistical procedures utilized in analysis of the data have remained fairly constant and satisfactory throughout the study series. Dimensions have customarily been scored in such a way as to obtain one average score on each dimension for each individual subunit studied. Split half scores are derived so that dimension reliabilities can be estimated. The total scores are then correlated with the criterion scores of organizational effectiveness by means of the epsilon technique (15). Conservative corrections for rectangular distributions in the criterion variable have been applied prior to testing epsilon_c coefficients for statistical significance.

In all cases, regressions of dimension scores on criterion variables have been employed. Perhaps the principal reason for this choice has been that criterion data in many cases are obtainable only in a limited number of categories. With the regression of dimension scores, obtainable readily in many categories, on criterion scores, no particular difficulty is encountered in computing epsilon coefficients. The reverse regression would present problems in this respect. If we were interested in making predictions of organizational effectiveness from dimension scores, this would be the wrong regression to employ. This does not constitute a serious problem, of course, unless curvilinear regressions are obtained. If the regression of dimension on criterion scores is curved, prediction in the other direction would be greatly hampered anyway, so no particular advantage would be gained by having epsilon for the reverse regression. The regression convention employed is entirely adequate for the purpose of exploring relationships which may exist in the domain studies, our main purpose in this work. It should be mentioned that the use of epsilon as a research technique has made possible the discovery of significant relationships which would have been overlooked had a linear type of analysis been employed. This comment is particularly pertinent in view of the fact that so many investigations relating items and item groups to criteria are carried out in such a way that curvilinear results cannot possibly appear, e.g., as in the case where two groups, "high" and "low" are used.

CHAPTER II

Dimensions of Organizational Behavior

The purpose of this chapter will be to provide a technical summary of the most meaningful findings from the research conducted under this contract. The first part of the chapter will be concerned with the standards which were applied in determining what should be reported as a meaningful finding. The actual findings will be presented separately for each dimension, bringing together data from different studies which bear upon the validity of that dimension in relation to criteria of organizational effectiveness. The dimensions have been grouped into three major kinds: (a) supervisor self evaluations, (b) situational evaluations, and (c) supervisor evaluations by subordinates. A separate section will be devoted to the results for each of these groups of dimensions.

Most of the dimensions presented will have emerged from one or more of the iterative analyses of questionnaire data described in studies Q3 through Q6 in Chapter I. In each case the actual items used to measure the dimension in the later validation studies will be given rather than just those items which survived an iterative analysis. Following the presentation of the items used to measure the dimension, a table will be given which summarizes the validity evidence from all those studies which met certain significance standards described below. No extended discussion will be given with each dimension, although comments will be made where the results need some qualifying statement. Interpretations of the results will be reserved for Chapter IV.

Table 1 lists all the questionnaire validation attempts which have been made on the project. The first two symbols in the study designation in column one are the same as those given in Chapter I where information was given about the general research procedures. An additional lower case letter has been added to the study designation symbol in Table 1 to identify the particular questionnaire study. Most of the research efforts reported as one study involved the use of several questionnaires with a single criterion or several criteria with a single questionnaire. Questionnaire validation attempts which were described in the same report are grouped together in Table 1. Explanations of the column headings are given in the footnote.

As might be expected in research of this kind, results from different questionnaire studies have not always been equally significant. A procedure was needed to select those studies which achieved a sufficiently high level of statistical significance to merit serious consideration. In the two columns of Table 1 headed by one and two stars (*), respectively, are given the numbers of dimensions significant at the five and one per cent levels of significance. The number of dimensions analyzed is given in the next column. In attempting to obtain a single index of the level of significance for the questionnaire study, a weight of "1" was given to each dimension significant at the five per cent level and a weight of "2" to each dimension significant at the one per cent level. For each questionnaire study the sum of these weights was divided by the number of dimensions analyzed to yield the "index" values listed in the last column of Table 1. An index value of exactly .05 would indicate a degree of significance equivalent to chance expectancy, e.g., one significant

Table 1
Questionnaire Study Data²

Study	Respondents	Cases	Units	Criterion	*	**	#	Index
V1a	forest supervisors	18	18-3	rating	3	0	16	.19
V1b	top line staff	34	18-3	rating	3	3	22	.41
V1c	technical staff	33	18-3	rating	3	0	20	.15
V1d	district rangers	46	18-3	rating	1	1	21	.14
V1e	district rangers	39	18-3	rating	0	0	21	.00
V1f	field service	79	18-3	rating	1	0	18	.06
V1g	field service	77	18-3	rating	0	0	23	.00
V1h	clerical workers	51	18-3	rating	0	0	20	.00
V2a	office managers	30	30-4	rating	0	0	16	.00
V2b	assistant managers	35	30-4	rating	2	1	19	.21
V2c	insurance workers	30	30-4	rating	3	0	16	.19
V2d	placement workers	33	30-4	rating	1	0	16	.06
V3	skilled tradesmen	1022	33-3	composite	4	2	13	.62
V4a	supervisors	68	24-3	composite	0	0	10	.00
V4b	helpers	163	26-3	composite	1	0	8	.12
V5a	district rangers	63	69-4	rating	1	0	21	.05
V5b	field service	93	69-4	rating	1	10	20	1.05
V6a	aircraft workers	213	29-4	work-rework	1	7	19	.79
V6b	aircraft workers	205	28-4	acceptance	1	1	19	.16
V6c	aircraft workers	197	27-4	production	4	2	19	.42
V6d	aircraft workers	213	29-4	rating	0	0	19	.00
V7a	supervisors	244	29-4	work-rework	1	1	24	.12
V7b	supervisors	235	28-4	acceptance	3	0	24	.12
V7c	supervisors	227	27-4	production	5	1	24	.29
V7d	supervisors	244	29-4	rating	1	3	24	.29
V8a	aircraft foremen	29	29-4	work-rework	1	0	21	.05
V8b	aircraft foremen	28	28-4	acceptance	1	0	21	.05
V8c	aircraft foremen	27	27-4	production	5	1	21	.33
V8d	aircraft foremen	29	29-4	rating	1	0	21	.05

² All studies designated by the same two beginning symbols, e.g., VI, V5, etc., have been reported together. The letter indicates a substudy in that report for which the respondents are designated in the second column. The number of persons in the substudy is given under "Cases." Under the column headed by "Units" appear two numbers separated by a dash. The first number gives the number of categories into which these units were divided for statistical

Table 2
Ranked Questionnaire Studies³

Study	Respondents	Criterion	Index	€ 05	€ 01
V5b	field service	rating	1.05	.23	.30
V6a	aircraft workers	work-rework	.79	.42	.53
V3	skilled tradesmen	composite	.62	.35	.46
V6c	aircraft workers	production	.42	.44	.55
V1b	top line staff	rating	.41	.49	.62
V8c	aircraft foremen	production	.33	.44	.55
V7c	aircraft supervisors	production	.29	.44	.55
V7d	aircraft supervisors	rating	.29	.38	.49
V2b	assistant managers	rating	.21	.41	.52
V1a	forest supervisors	rating	.19	.49	.62
V2c	insurance workers	rating	.19	.41	.52

³ The column headings are the same as in Table 1 except for the last two columns which give the values of ϵ_c required for significance at the five and one per cent levels of significance, respectively.

With regard to the Department of Employment Studies (V2a, b, c, and d) it should be mentioned that erroneously high significance levels were applied in the published report (4) resulting in a paucity of significant findings. The values given here are correct.

² (Continued)
analysis. The criterion used is given in the next column. Under the columns headed by one and two stars (*) respectively are given the number of dimensions significant at the five and one per cent levels of significance, respectively. The next to last column gives the number of dimensions analyzed, and the last column provides a single index of study significance described in the text.

dimension out of 20 analyzed.¹ The total distribution of these index values reveals a range from .00 to 1.05. Eleven studies had index values in excess of .19 while the remainder of the studies ran .16 or less.

If serious consideration is to be given the results of a study which purports to demonstrate the existence of a relationship, it would seem desirable to be relatively certain that the results as a whole exceed the chance level of significance. For this reason, the decision was reached to select from the 29 questionnaire studies only those in which there is relatively little doubt that the results exceed chance expectancy. In summarizing the research for this project, therefore, we will show the findings only from the eleven questionnaire studies which reached the index value of .19 or above. These studies are listed in Table 2. Thus, when data are given which purport to bear on the validity of a particular dimension of organizational effectiveness, they will be based on all available evidence from the eleven studies listed in Table 2. The findings from the remaining studies will not be presented, since their validity is open to question because of the general paucity of significant results obtained. Reports of these studies are available, however, and may be consulted by the reader. (See Chapter I for references)

Supervisory Self Evaluation Dimensions

The dimensions which have been developed may be divided roughly into three kinds: (a) those which ask a supervisor to make some evaluation about himself and his attitudes, (b) those which ask a respondent, supervisory or other, to evaluate certain aspects of the total job setting and his relation to it, and (c) those which ask a respondent to evaluate his supervisor. The dimensions to be presented in this section belong to the first of these categories.

For each dimension presented, the actual items used will be given. In those cases where the items used differed from one study to the next, full information will be given on the items used for the recent studies. If the early items differed seriously in kind, comment to this effect will be made.

Most of the dimensions presented emerged from one or more of the iterative studies conducted for the purpose of improving dimension internal consistency and independence. As has been mentioned in connection with the description of these studies in Chapter I (See studies Q3, et seq.) not all of the items originally making up a dimension actually survived an iterative analysis. Many were discarded as being too highly correlated with dimensions other than the one to which they were supposed to belong or because they failed to correlate highly enough with the dimension in which they were originally included. If a dimension in question did emerge as a relatively independent dimension from one of the various iterative studies, biserial correlations will appear in parentheses following at least some of the items given. If no correlation coefficient follows any item for the dimension, the items determining it failed to be sufficiently independent of the other dimensions to emerge from the iterative

¹ This index is admittedly arbitrary. No exact criterion could be stated without taking into account the intercorrelations of dimensions.

analysis. Some items within an iterated dimension will not have correlations with total dimension score given; these items appeared with the dimension as originally presented but did not survive any iterative analysis in which they were included. The validity evidence shown is based on the dimension with all items included, rather than with just the iterated items. The intercorrelations and factor analysis of dimensions appearing in Chapter III, however, will be based on dimensions composed only of the iterated items.

The item-total biserial correlations are based on total dimension scores, which include the item score, hence there is some spurious covariance due to overlapping error variance. For this reason, the correlations will usually be somewhat too high. It would be impractical to extract this spurious covariance except by leaving the item out of the composite, either actually or by statistical correction. This process is not considered desirable since it would remove the overlapping true variance as well as the error variance, thereby giving the correlation with a composite made up of the remaining items. Since there are so few items in each composite, the dimension would be apt to change considerably through omission of an item; therefore, the correlations are presented without correction.

Adequate Authority

You feel that you should be allowed to make some decisions that are now being made at a higher level: 1. definitely 2. probably 3. possibly 4. probably not 5. definitely not (.56)

You must get approval for certain decisions which you need to be able to make alone: 1. probably not 2. possibly 3. probably 4. definitely 5. very definitely (.79)

You have enough authority to handle emergency situations adequately: 1. probably not 2. possibly 3. probably 4. definitely 5. very definitely (.87)

Do you have enough authority to handle the problems that come up in your group? 1. probably not 2. possibly 3. probably 4. definitely 5. very definitely (.85)

Table 3

Study	M ₁	M ₂	M ₃	M ₄	t_c	#	M	s	r ₁₁
V1a	4.0	4.5	3.5	-	.00	3	4.0	1.69	.00
V1b	12.2	12.5	11.8	-	.00	6	12.2	2.15	.62
V2b	9.7	9.2	7.3	7.7	.38	5	8.5	2.20	.27
V7c	14.2	14.5	13.2	12.8	.34	4	13.7	1.43	.79
V7d	14.6	13.6	12.7	-	.49**	4	13.6	1.47	.79
V8c	16.2	16.8	12.7	13.0	.48*	4	14.6	3.32	.74

* Significant at the .05 level

** Significant at the .01 level

Under the column headed by "Study" in Table 3 and subsequent tables in this chapter is given the questionnaire study code number taken from Table 1. The values under columns headed by M_1 , M_2 , M_3 , and M_4 give the mean dimension scores for ranked criterion groups in that particular study. Usually there will be four criterion groups, "high," "medium high," "medium low," and "low," but sometimes only "high," "medium," and "low," groups are used. The corrected epsilon coefficients and number of items in the composite appear in the next two columns. The overall means, standard deviations, and internal consistency estimates of reliability for the dimension scores appear in the last three columns. To conserve space, titles have been omitted from these tables. No further explanation of the table symbols will be given in the remaining tables of this kind.

The dimension was called "Good Authority Status" in the first three studies. Items in the first study were only three in number and two of these offered the respondent less than four choices to record his opinion.

Adherence to Regulation Work Patterns

It has been necessary to disregard a regulation in order to get tools or materials needed for a job: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.92)

It has been necessary to short-circuit official channels in order to get a job done: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.92)

Customary work methods are disregarded in rush jobs: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.

Some of the rules and regulations regarding work procedures are broken by almost everyone: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.

Table 4

Study	M_1	M_2	M_3	M_4	ϵ_c	#	M	s	r_{11}
V7c	11.7	10.6	10.8	9.4	.41	4	10.7	1.41	.56
V7d	11.1	10.7	10.0	-	.22	4	10.6	1.36	.56
V8c	10.4	11.6	9.1	10.6	.20	4	10.4	2.66	.61

Attitude Toward Paper Work

Paper work required of you interferes with other work that is really more important: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.88)

Routine record keeping and report writing is a burden to you: 1. almost always 2. usually 3. occasionally 4. rarely 5. almost never (.92)

How many of the reports and records you are required to keep are really necessary? 1. few 2. some 3. most 4. almost all 5. all (.88)

How much time is spent keeping records and writing reports which do not really

accomplish anything useful? 1. a great deal 2. quite a bit 3. some
4. not much 5. none (.88)

Table 5

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V7c	15.2	13.8	13.3	12.7	.34	4	13.7	1.78	.87
V7d	14.5	13.0	13.0	-	.27	4	13.5	1.92	.87
V8c	12.8	16.2	11.6	12.2	.55**	4	13.3	3.23	.85

The slight curvilinear trend noted in study V8c can probably be ignored for the time being because the other two studies show a relatively linear trend.

Avoidance of Unpleasantness

When you see a subordinate do something wrong you hate to correct him: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.72)
 You find it unpleasant to tell an employee he has done a job poorly: 1. almost never 2. rarely 3. occasionally 4. usually 5. almost always (.97)
 You ignore employee's mistakes to avoid unpleasantness: 1. almost never 2. rarely 3. occasionally 4. usually 5. almost always (.48)
 You find it difficult to tell an employee to his face that he is incompetent (assuming he is): 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.87)

Table 6

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V7c	6.5	7.5	7.3	7.4	.00	4	7.2	1.14	.35
V7d	7.6	6.8	7.5	-	.12	4	7.3	1.15	.35
V8c	11.2	9.8	10.4	9.6	.26	4	10.2	1.38	.11

These items, all of which emerged from the iterative analysis, are the same ones which were used for the dimension in the three validation studies listed, with one exception. Through a typographical error, the words "hate to" were omitted from the first item in study V8c. This error might have accounted for the small positive correlation in that study.

Backing Up Decisions

You feel confident of the superintendent's support when you make a decision:

1. rarely 2. occasionally 3. usually 4. almost always 5. always.
 It would be easy for a subordinate to get one of your decisions reversed by going over your head: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.
 There have been situations in which your actions were not backed up by your superiors: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.
 Important decisions you make within the limits of your authority are backed up by your superiors: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.

Table 7

Study	M ₁	M ₂	M ₃	M ₄	(_c	#	M	s	r ₁₁
V8c	16.4	17.9	15.6	13.6	.44*	4	16.1	2.80	.68

This particular dimension appeared only in the Lockheed study of aircraft foremen. An iterative analysis was not performed for the Lockheed foreman data. There does seem to be considerable similarity, however, between this dimension and the dimension Adequate Authority, which was also significant in study V8c.

Confidence in the Company

In comparison with the aircraft produced by other companies, the quality of those produced at Lockheed is: 1. below average 2. average 3. above average 4. excellent 5. outstanding (.69)
 In comparison with other aircraft companies, production efficiency at Lockheed is: 1. below average 2. average 3. above average 4. excellent 5. outstanding (.84)
 How much confidence do you have in the capacities and abilities of people at higher levels of supervision at Lockheed: 1. very little 2. not much 3. some 4. quite a bit 5. a great deal (.78)
 In comparison with other aircraft companies, how is Lockheed as a place to work? 1. below average 2. average 3. above average 4. excellent 5. outstanding (.91)

Table 8

Study	M ₁	M ₂	M ₃	M ₄	(_c	#	M	s	r ₁₁
V7c	16.2	15.5	15.0	14.3	.44*	4	15.2	1.19	.73
V7d	16.0	14.6	14.9	-	.44*	4	15.2	1.24	.73
V8c	16.6	15.2	14.6	15.2	.00	4	15.3	2.22	.79

Democratic Orientation

- You like to think of yourself as the "coordinator" of your group rather than the "boss": 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.72)
- Your subordinates should have more of a voice in running the department than they do now: 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.53)
- If you and a subordinate disagree on how something should be done, you will do it his way rather than insist on what you think is correct: 1. almost never 2. rarely 3. occasionally 4. usually 5. almost always (.56)
- A supervisor should ask for his more experienced employee's advice before making a decision: 1. never 2. rarely 3. occasionally 4. usually 5. almost always (.53)
- How many of the supervisors you have known seem to be "wishy-washy" in the way they handle their subordinates? 1. a good percentage 2. several 3. a few 4. 1 or 2 5. none.
- Would anyone ever accuse you of allowing your subordinates too much influence in running your department? 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely.

Table

Study	M_1	M_2	M_3	M_4	t_c	#	M	s	r_{11}
V7c	15.0	16.4	15.8	16.2	.00	6	15.9	1.41	.16
V7d	16.2	15.8	15.7	-	.00	6	15.9	1.36	.16
V8c	16.0	16.0	15.6	17.0	.00	6	16.0	3.13	.41

There is no apparent evidence of validity for this dimension, although it definitely appears to represent a distinct aspect of organizational behavior. The dimension may eventually prove to be important in relation to some other kind of criterion.

Human Relations vs Production Centered

- Getting out the work is the most important aspect of your job: 1. definitely 2. probably 3. maybe 4. probably not 5. not at all (.52)
- The current emphasis on the importance of "human relations" to production is exaggerated: 1. very definitely 2. definitely 3. possibly 4. probably not 5. definitely not (.56)
- What proportion of your time is spent in consulting and counseling subordinates? 1. very little 2. a little 3. some 4. quite a bit 5. a great deal (.49)
- Keeping up the morale in your unit is your most important job: 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.62)

Table 10

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V7c	13.6	13.7	13.5	12.6	.00	4	13.4	1.26	.18
V7d	13.8	13.1	13.0	-	.12	4	13.3	1.26	.18
V8c	13.4	13.9	14.4	13.6	.00	4	13.9	1.87	.03

No evidence for the validity of this dimension is present here, but further refinement of the dimension might produce desirable results. As it is now, the dimension is low on internal consistency.

Lack of Job Security Consciousness

In selecting personnel for better jobs, how much weight should be given seniority?

1. a great deal 2. quite a bit 3. some 4. very little 5. none.

When an employee is definitely inefficient he should be dismissed: 1. rarely

2. occasionally 3. usually 4. almost always 5. always.

Do you think that permanent employees should be periodically evaluated on some scale of merit which really differentiates among them? 1. definitely not

2. probably not 3. possibly 4. probably 5. definitely.

Would you take a job with better opportunity but less security? 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely.

Table 11

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V8c	9.8	10.6	8.0	7.5	.53*	4	9.2	2.08	.15

This dimension appeared only in the Lockheed foremen questionnaire. The dimension as originally used was scored in the reverse direction but the criterion group means have been reversed here so that a positive score on the dimension is presumably indicative of effective organization.

Non-Hypercritical Attitude Toward Subordinates

Your employees need to be supervised to get good work out of them: 1. usually 2. occasionally 3. rarely 4. almost never 5. never (.59)

About what percentage of the employees in your department could do much better work? 1. 80% or more 2. 60% 3. 40% 4. 20% 5. 0% (.88)

Your employees can be trusted to keep working whether you are there or not:

1. rarely 2. occasionally 3. usually 4. almost always 5. always (.62)

About what percentage of your employees would you replace if you could? 1. 80%

or more 2. 60% 3. 40% 4. 20% 5. 0% (.75)
 About what percentage of your employees are incompetent? 1. 80% or more 2. 60%
 3. 40% 4. 20% 5. 0% (.62)
 How many of your employees really try to do a good job? 1. a few 2. some 3.
 most 4. almost all 5. all (.79)

Table 12

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1a	4.3	3.5	1.7	-	.48	5	3.1	2.02	.77
V1b	3.2	3.6	3.4	-	.00	3	3.4	.76	.00
V7c	21.1	21.3	20.9	21.3	.00	6	21.1	1.28	.60
V7d	21.6	20.9	20.7	-	.20	6	21.1	1.26	.60
V8c	24.2	23.5	20.3	22.6	.47 ⁺	6	22.4	2.84	.72

This dimension was scored in the reverse direction in the first studies but the means have been interchanged here to make the results consistent with the present dimension direction. Items in those studies were similar to those given here. The two instances where the dimension resulted in high epsilon values were for top management groups rather than supervisors. Thus, it would appear on the basis of these data that the dimension is apt to show a relationship at the higher levels but not necessarily at the lower levels.

Reserve

Do you think that some supervisors are too informal with their subordinates? 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.62)
 You believe social contacts with subordinates should be limited: 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.74)
 You prefer to maintain a certain distance between yourself and your subordinates: 1. never 2. rarely 3. occasionally 4. usually 5. almost always (.72)
 A supervisor should avoid revealing intimate details of his personal life to any of his subordinates: 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.52)

Table 13

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V7c	13.5	13.7	13.4	12.6	.00	4	13.3	1.40	.50
V7d	13.1	14.1	12.9	-	.31	4	13.4	1.38	.50
V8c	12.2	15.8	13.4	13.6	.30	4	13.9	2.94	.51

This dimension was originally included to test the notion that an administrator should avoid getting too familiar with his subordinates.

Self Improvement

On your own time, you work at improving your job skills: 1. not at all 2. a little 3. some 4. quite a bit 5. a great deal (.45)

How much have you done within the past six months to prepare yourself for a promotion? 1. nothing 2. very little 3. some 4. quite a bit 5. a great deal (.82)

In off hours, you read things that will help you do a better job: 1. not much 2. a little 3. some 4. quite a bit 5. a great deal (.88)

You try to learn about higher jobs so that you will be ready to take one when the chance comes: 1. not at all 2. a little 3. some 4. quite a bit 5. a great deal (.88)

Table 14

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V7c	14.6	13.6	13.9	14.3	.00	4	14.0	1.21	.76
V7d	14.2	13.6	14.0	-	.00	4	13.9	1.22	.76
V8c	14.2	14.8	14.6	14.4	.00	4	14.5	2.62	.73

Urgency

Does it make you uncomfortable if things don't get done on time? 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.82)

You find it difficult to maintain pleasant relations with a subordinate who works slowly: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.55)

You get a kick out of trying to get a job done faster than others can do it: 1. never 2. rarely 3. occasionally 4. frequently 5. very frequently (.55)

It irritates you if a subordinate doesn't do a job quickly enough: 1. almost never 2. rarely 3. occasionally 4. usually 5. almost always (.76)

Table 15

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V7c	13.5	13.9	13.8	14.1	.00	4	13.8	1.04	.30
V7d	13.3	14.2	14.0	-	.32	4	13.8	1.04	.30
V8c	15.0	12.2	15.6	15.0	.44*	4	14.4	2.66	.60

The available validity evidence here is too meagre and contradictory to draw any conclusion. There may be a slight negative relationship to organizational effectiveness, but at present the items may be considered only as a dimension of organization behavior with doubtful validity status.

Discussion. During the early studies conducted by this research group, relatively few self evaluatory dimensions by administrative personnel achieved any significant relationship with criteria of organizational effectiveness. Many dimensions along new lines were tried out for such groups in the last series of studies at Lockheed. Although the evidence thus far is not extensive, it would appear that there may be some hope in this area for properly devised dimensions.

Of the dimensions which have been presented in this section, the following ones seem to bear some positive relationship with criteria of organizational effectiveness which have been employed: Adequate Authority, Adherence to Regulation Work Patterns, Attitude Toward Paper Work, Backing Up Decisions, Confidence in the Company, Lack of Job Security Consciousness, and Non-Hypercritical Attitude Toward Subordinates. It is understood, naturally, that the conclusion offered with respect to these dimensions is based upon the evidence presented from studies carried out by this research group. Their ultimate validity must be determined by the test of further research.

Situational Evaluation Dimensions

Respondents in our studies were usually asked to answer certain questions concerning their reactions to the group and the relationships among people in their work units. The dimensions to be presented in this section are made up of items in this area.

Absence of Dissension

There are people in your group who refuse to speak to each other: 1. several 2. some 3. a few 4. one or two 5. none (.71, .81)
 There are people in your group who seem to have it in for somebody else: 1. several 2. some 3. a few 4. one or two 5. none (.91, .82)
 Certain groups of people in your unit have it in for each other: 1. definitely 2. probably 3. possibly 4. probably not 5. definitely not (.88, .88)
 There is bad feeling between groups of people in your department: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.86, .72)
 When men in the unit get angry at each other, they hold a grudge: 1. usually 2. occasionally 3. rarely 4. almost never 5. never (.74, .76)
 People in your unit quarrel with each other: 1. a great deal 2. quite a bit 3. some 4. not much 5. not at all (.78, .77)

Table 16

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	6.4	5.8	5.1	-	.25	4	5.8	1.09	.50
V2b	9.8	7.5	6.1	5.4	.46	5	7.2	2.96	.56
V5b	3.9	4.2	4.3	4.1	.06	6	4.1	.76	.88
V6a	24.0	24.7	25.6	23.9	.13	6	24.5	1.90	.82
V6c	25.2	23.6	24.7	24.3	.00	6	24.4	1.86	.82

The means for study V5b in this and subsequent tables are low because they are average dimension item scores. To make these scores comparable, unit wise, multiply by the number of items. In the first two studies listed above the dimension was entitled "Dissension" and scored accordingly. The mean values here have been interchanged to make the trend consistent with the present direction of scoring. The items as given differ to a significant degree from those in studies V1b and V2b where they emphasized to a greater degree disharmony which was in direct interference with organization work. For example, one item stem from both these studies was: "You have had difficulty getting a job done because someone failed to cooperate." It would thus seem doubtful whether the higher epsilon values in the first two studies could be taken as supporting the validity of the item group presented.

Good Conference Practice

In group meetings with your foreman, how many of those present participate in discussions? 1. very few 2. some 3. several 4. most 5. almost all.

Group meeting time with your foreman is consumed by problems that could be settled more effectively by other means: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.

Are group conferences in your department merely a way of providing an audience for the foreman? 1. usually 2. occasionally 3. rarely 4. almost never 5. never.

In group meetings with your foreman, those present seem hesitant to speak up when they oppose a particular point of view expressed by the foreman: 1. usually 2. occasionally 3. rarely 4. almost never 5. never.

Table 17

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	7.2	8.4	8.2	-	.00	6	7.9	1.91	.00
V2b	8.8	8.2	7.1	7.7	.10	4	8.0	1.95	.25
V7c	17.3	16.8	15.8	13.9	.57**	4	16.0	1.89	.72
V7d	16.8	16.0	15.2	-	.24	4	16.0	1.83	.72

The items for this dimension did not survive the iterative analysis as a distinct group in that they were too highly correlated with more than one item group. That this dimension is related to these criteria of organizational effectiveness, however, seems highly probable. The items given are those used in the V7 studies but those in studies V1b and V2b are similar.

Group Unity

The employees in your group seem to stick together like a team: 1. not at all 2. a little 3. some 4. quite a bit 5. a great deal (.87, .72)

The employees in your group talk things over with the idea of acting as a group: 1. almost never 2. rarely 3. once in a while 4. occasionally 5. frequently (.87, .91)

Employees in your group act together to get the things they want: 1. never 2. rarely 3. occasionally 4. frequently 5. very frequently (.87, .75)

Employees in your group would go out of their way to stand up for each other: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.82, .74)

Table 18

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V5b	3.1	3.1	3.2	2.9	.00	4	3.1	1.02	.89
V6a	12.2	12.3	12.2	13.1	.00	4	12.5	1.42	.72
V6c	13.0	11.2	12.9	12.8	.47*	4	12.4	1.43	.72

Informal Leadership

The opinions of popular workers in your district have power over the other employees: 1. not at all 2. a little 3. some 4. quite a bit 5. a great deal (.62, .85)

There are certain workers in your district besides the district ranger who seem to influence the others unduly: 1. not at all 2. a little 3. some 4. quite a bit 5. a great deal (.73, .82)

Some workers in your district, besides the district ranger, control the actions of other employees more than they should: 1. not at all 2. a little 3. some 4. quite a bit 5. a great deal (.73, .82)

The word of the "old timers" in your district carries weight with the other employees: 1. not at all 2. very little 3. some 4. quite a bit 5. a great deal (.48, .62)

Table 19

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V3	10.5	10.7	10.8	-	.00	4	10.6	1.22	.84
V5b	2.2	2.4	2.1	2.5	.03	4	2.3	.70	.73
V6a	9.2	7.8	9.0	9.4	.13	4	8.9	1.83	.77
V6c	8.7	9.4	8.2	9.0	.00	4	8.8	1.77	.77

In study V3, this dimension was called "Intensity of Informal Control."

Pride in Work Group

You take pride in the work record of your group: 1. not at all 2. a little
3. some 4. quite a bit 5. a great deal (.67, .64)

You would rather work with your present group than with any other: 1. definitely
not 2. probably not 3. probably 4. definitely 5. very definitely (.91,
.72, .88)

As compared with other departments, in the plant yours is: 1. below average
2. average 3. above average 4. excellent 5. outstanding (.81, .65, .82)

You have told friends that your group is a good outfit: 1. never 2. rarely
3. occasionally 4. frequently 5. very frequently (.80, .82, .85)

It makes you mad when someone in your unit doesn't try to do a good job: 1. never
2. rarely 3. sometimes 4. usually 5. always (This was the fifth item
in studies V6)

Table 20

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1a	1.0	0.8	0.7	-	.00	1	0.8	.56	-
V1b	2.5	2.8	2.5	-	.00	1	2.6	.54	-
V2b	5.4	4.1	3.8	3.0	.52**	2	4.1	1.44	.30
V2c	9.0	7.8	6.1	5.7	.48*	3	7.1	2.38	.24
V5b	4.0	3.7	3.4	3.7	.22	4	3.7	.78	.75
V6a	18.6	17.5	19.3	17.7	.53**	5	18.3	1.20	.69
V6c	18.2	18.1	18.4	18.7	.00	5	18.3	1.23	.69
V7c	16.5	16.6	16.1	14.5	.35	4	16.0	1.58	.78
V7d	17.3	15.2	15.4	-	.63**	4	16.0	1.53	.78
V8c	16.8	17.0	15.7	15.2	.04	4	16.2	2.14	.46

Items in the first four studies were somewhat different from those given

but similar in nature. The first and last studies cited dealt with the heads of units. It would appear doubtful if anything is to be gained by asking these questions at such a high administrative level. In study V6a, a work-rework quality control criterion was employed. The results for this study, although highly significant, were generally curvilinear with the two middle groups receiving the most favorable average scores. No convincing explanation for this phenomenon has been developed as yet.

Discussion. Of the dimensions presented in this section, only Good Conference Practice and Pride in Work Group seem to bear any clearcut positive correlation with organizational effectiveness. It is recommended that these dimensions be given in questionnaires to personnel below the level at which criterion measures are taken.

Supervisor Evaluation Dimensions

The largest category of dimensions developed by this project contains those in which the respondent makes certain judgments about his supervisor. From the standpoint of validity, the most significant results have been obtained with dimensions of this kind. In the items that will be given, where the words "he" or "him" appear the person referred to is the respondent's supervisor or superior.

Advance Planning

- Your district has suffered because his previous budget planning failed to have specific plans for improvement: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.
- He plans ahead, keeping in mind the future needs of the district: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.
- When a difficult situation develops which might have been foreseen, he has plans already laid to deal with it: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.
- Do bad peak periods develop because routine work was not spaced properly through advance planning? 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.
- Does he have specific plans for future development and improvement of the district? 1. no 2. yes.
- Have bad personnel situations developed because he did not plan ahead? 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.

Table 21

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V5b	3.2	3.3	2.9	2.4	.35**	6	3.1	.72	.91

This dimension failed to emerge from the iterative analysis of field service dimensions because the items given above correlated with several other dimensions, notably Planning and Organizing. There is probably sufficient valid variance specific to this dimension to warrant its independent use despite its high correlation with other dimensions. This dimension would seem to be particularly useful in those situations where the supervisor being rated has a great deal of autonomy.

Communication Down

- He keeps to himself information employees would like to have: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.62, .79)
 You know where you stand with him: 1. never 2. rarely 3. occasionally 4. usually 5. always (.62)
 His employees could do a better job if he would let them know more about what was going on: 1. definitely 2. probably 3. maybe 4. probably not 5. not at all (.60, .87)
 He passes on interesting bits of information he gets from the front office: 1. never 2. rarely 3. occasionally 4. usually 5. almost always (.75, .89, .77)
 He lets employees in on information from higher up: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.85, .89, .88)
 He seems willing to pass on non-secret information he gets from higher up: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.78, .91, .92)

Table 22

Study	M ₁	M ₂	M ₃	M ₄	r _c	#	M	s	r ₁₁
V1b	4.2	2.6	3.4	-	.54*	2	3.4	1.18	.85
V2b	7.3	6.5	4.9	5.7	.25	3	6.1	2.31	.60
V5b	3.1	3.4	3.2	2.5	.20	6	3.2	.94	.90
V6a	16.4	18.2	19.1	17.0	.36	6	17.6	2.24	.73
V6c	19.8	17.5	18.0	15.5	.64***	6	17.7	1.97	.73
V7c	18.3	20.5	18.5	16.3	.36	6	18.7	3.04	.83
V7d	19.4	13.4	18.8	-	.00	6	18.9	3.08	.83

The six items given above were used in all but the first two studies listed in Table 22. The items were subjected to three different iterative analyses. In those cases where less than three item-total score values appear after an item, the item failed to hold up in one or two of the iterative analyses. In the first two studies, the dimension was called "Being Informed."

Consistency

If he disciplines an employee for a rule infraction, the next person who violates

the rule will also be disciplined: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.72)
 His subordinates know what to expect from him: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.66)
 You know pretty much how he is going to react to any given job situation: 1. almost never 2. rarely 3. occasionally 4. usually 5. almost always.
 He changes his mind without good reason: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.

Table 23

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	2.8	2.7	1.8	-	.27	3	2.4	1.14	.82
V2b	3.3	3.1	2.2	3.4	.00	2	3.0	2.02	.33
V2c	4.0	3.2	3.8	3.0	.00	3	3.5	2.30	.47
V3	24.5	23.0	24.5	-	.44*	6	24.0	1.58	.90
V5b	3.7	3.7	3.5	3.0	.35**	4	3.6	.80	.71
V6a	15.3	16.5	16.0	15.1	.56**	4	15.7	0.93	.40
V6c	16.2	15.4	16.0	15.7	.02	4	15.8	.92	.40

The items given above were the ones used in the last three studies listed in Table 23. The dimension emerged from only one of two iterative analyses, however, and only the first two items survived. In the first three studies listed, the dimension was called "Inconsistency." The group means have been reversed here to make the direction of scoring conform with the present title.

Decisiveness

There have been situations in which he seemed afraid to act: 1. frequently 2. occasionally 3. seldom 4. almost never 5. never (.67)
 He acts cautiously in order to avoid sticking his neck out: 1. almost always 2. usually 3. occasionally 4. rarely 5. almost never (.87)
 He would "sit tight" and do nothing rather than take a chance on doing something wrong: 1. almost always 2. usually 3. occasionally 4. rarely 5. almost never (.76)
 Does he "put off" making important decisions? 1. almost always 2. usually 3. occasionally 4. rarely 5. almost never (.72)

Table 24

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	7.8	7.4	6.2	-	.29	4	7.1	1.66	.80
V2b	11.6	10.9	8.6	7.8	.33	4	9.7	3.37	.28
V2c	5.4	4.9	5.7	5.0	.00	2	5.2	1.49	.03
V5b	3.6	3.5	3.4	2.5	.28*	4	3.4	.97	.86
V6a	14.2	15.4	15.2	14.1	.26	4	14.7	1.44	.64
V6c	16.0	14.2	15.0	14.1	.42	4	14.8	1.37	.64
V7c	16.0	16.1	14.8	14.3	.31	4	15.3	1.78	.40
V7d	15.6	15.1	15.0	-	.00	4	15.3	1.77	.90

The items given were the ones used in the last five studies listed, although the dimension emerged in only one of three iterative analyses. In the other two, the items were too highly correlated with other dimensions. Items in the first three studies were similar to those in the last five studies.

Discipline

He has avoided taking disciplinary measures when the occasion demanded it: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.76)
 He lets people get away with violating regulations: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.79)
 He is firm in dealing with people when it is necessary: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.
 He would rather put up with poor work than discipline the employee responsible: 1. almost always 2. usually 3. occasionally 4. rarely 5. never.

Table 25

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V5b	4.0	4.0	3.5	2.7	.41**	4	3.8	.92	.93
V6a	15.5	16.2	16.0	15.0	.29	4	15.7	1.16	.60
V6c	16.3	15.1	16.0	15.6	.16	4	15.7	1.18	.60

Only two of the above items survived the iterative analysis with Lockheed journeymen. The dimension did not emerge separately in the field service iterative analysis.

Formalization

- How many of his employees have been provided with clear-cut written descriptions of their duties? 1. none 2. few 3. some 4. most 5. all (.92, .81)
- When work assignments are given, he provides a written copy for those involved: 1. never 2. rarely 3. occasionally 4. usually 5. almost always (.90, .88)
- He has provided employees with an adequate written statement of rules and regulations to be followed: 1. no 2. yes (.72, .82)
- He makes available adequate written statements of procedures to be used in carrying out work assignments: 1. never 2. rarely 3. occasionally 4. usually 5. almost always (.94, .95)
- He has made available to his employees an up-to-date organization chart: 1. no 2. yes.
- He likes to have work plans written down: 1. never 2. rarely 3. occasionally 4. usually 5. almost always.

Table 26

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V5b	3.2	3.3	2.9	2.8	.33**	6	3.1	.59	.89
V6a	16.4	17.0	16.9	15.0	.26	6	16.3	2.06	.84
V6c	16.7	16.6	16.8	14.7	.19	6	16.3	2.11	.84

This dimension was adapted from an earlier version by the same name in studies V1, V2, and V3. In those studies, the dimension was not specifically related to the respondent's supervisor and the items were sufficiently different in nature that data for them were not regarded as particularly pertinent here.

Global Planning vs Details

- He spends more time in planning and overseeing than in working with details: 1. almost never 2. usually not 3. occasionally 4. usually 5. almost always (.62)
- How much of his time is spent in solving the small, everyday problems that come up? 1. a great deal 2. considerable 3. some 4. not much 5. very little (.83)
- How much of his time is spent in taking care of unexpected problems that come up? 1. a great deal 2. considerable 3. some 4. not much 5. very little (.67)
- He spends more time working alone at problems than talking to or working with subordinates: 1. not at all 2. a little 3. somewhat 4. considerably 5. very much.

Table 27

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V7c	12.5	11.8	11.8	12.4	.00	4	12.1	1.18	.48
V7d	12.4	11.6	12.3	-	.11	4	12.1	1.15	.48

Good Judgment

How many times can you remember when he made a poor decision? 1. four or more
2. three 3. two 4. one 5. none.

Bad judgment on his part has resulted in wasted effort: 1. frequently 2.
occasionally 3. rarely 4. almost never 5. never.

He has made costly mistakes: 1. frequently 2. occasionally 3. rarely 4. al-
most never 5. never.

How much confidence do you have in his judgment? 1. very little 2. not much
3. some 4. quite a bit 5. a great deal.

Table 28

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	4.8	4.8	3.6	-	.32	3	4.4	1.24	.48
V2b	4.1	4.4	4.0	4.0	.00	2	4.1	2.02	.36
V3	23.4	21.1	23.4	-	.52**	6	22.5	2.05	.95
V6a	15.7	17.2	17.3	15.4	.54**	4	16.4	1.38	.67
V6c	17.6	15.7	17.0	15.7	.46*	4	16.5	1.42	.67

The items are those used in the V6 studies. The dimension did not survive the iterative analysis. It should perhaps be mentioned that in studies V3 and V6a, curvilinear trends similar to these were also obtained for most of the other dimensions which proved to be significant.

Influence With Superiors

He has made recommendations for wage increases for his workers which did not go through: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.65)

He has requested from his superiors certain benefits for his workers which have not been approved: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.72)

If he were to formally discipline a subordinate and it were challenged by the union, his superiors would back him up: 1. probably not 2. possibly 3. probably 4. definitely 5. very definitely (.82)

Does he have influence with his superiors in getting certain benefits for his subordinates? 1. none 2. a little 3. some 4. quite a bit 5. a great deal (.66)

Table 29

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V7c	15.3	13.8	13.4	12.5	.50*	4	13.7	1.53	.18
V7d	14.4	13.1	13.4	-	.29	4	13.7	1.50	.18

Although the internal consistency is not very high in this dimension, the preliminary evidence from the two studies would seem to suggest that it constitutes a fruitful area for further investigation.

Job Competence

You have found that he doesn't know something about the job that he should: 1. frequently 2. occasionally 3. seldom 4. almost never 5. never (.82)
 When a tough job comes up, he has the technical "know-how" to get it done: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.86)
 He plans ahead, keeping in mind the future needs of the district: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.84)
 When a subordinate doesn't know how to do a job, can he show how it is done? 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.94)
 He has failed to do a good job because of poor technical skill or lack of knowledge: 1. frequently 2. occasionally 3. seldom 4. almost never 5. never.

Table 30

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	11.7	12.0	11.8	-	.00	8	11.8	1.64	.26
V2b	10.9	9.4	9.4	8.3	.15	4	9.5	2.40	.26
V2c	24.1	28.0	22.9	23.3	.00	10	24.6	7.26	.48
V5b	3.8	3.6	3.2	2.7	.31**	4	3.5	.89	.94
V6a	16.3	17.8	16.3	14.4	.65**	4	16.1	1.82	.75
V6c	17.3	15.6	16.8	14.8	.38	4	16.2	1.87	.75

The first four items given here were the ones used in study V5b where they appeared as an iterated dimension. The fifth item was substituted for item number three in the V6 studies. The dimension was entitled "Personal Competence"

in the first three studies.

Job Helpfulness

He is impatient with you if you ask for his help: 1. usually 2. occasionally 3. rarely 4. almost never 5. never.
 You have seen him go out of his way to help someone with a job problem: 1. almost never 2. rarely 3. occasionally 4. fairly often 5. frequently.
 If you needed information about the job, he would take time to get it for you: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.
 He would show you how to go about a new job if you asked him: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.

Table 31

Study	M ₁	M ₂	M ₃	M ₄	\bar{c}_c	#	M	s	r ₁₁
V1b	11.4	9.2	8.7	-	.47	5	9.8	2.26	.67
V2b	17.9	15.4	12.6	13.0	.42*	6	14.7	4.13	.68
V2c	4.0	3.9	3.4	3.8	.00	2	3.8	1.40	.08
V3	24.7	22.8	25.1	-	.49**	6	24.1	1.95	.94
V5b	4.1	4.1	4.0	3.4	.17	4	4.0	.87	.82
V6a	17.6	18.7	17.7	16.2	.71**	4	17.5	1.26	.69
V6c	18.4	16.8	17.7	17.3	.29	4	17.5	1.28	.69
V7c	16.9	16.4	14.9	13.9	.52*	4	15.6	1.89	.82
V7d	16.0	15.6	15.1	-	.00	4	15.6	1.83	.82

This dimension did not prove to be sufficiently independent to survive any of the three iterative analyses in which it appeared. The variance for these items was spread over several of the dimension areas. The dimension should still be employed, however, since a considerable amount of valid variance probably remains which is not common to the other dimensions.

Lack of Arbitrariness

He is willing to listen to your ideas: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.88)
 He hates to have employees disagree with him: 1. always 2. usually 3. occasionally 4. rarely 5. almost never (.89, .90, .92)
 If you or another worker offer him a good idea, he will use it if possible: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.87, .82)
 He gets sore if employees question his orders: 1. usually 2. occasionally 3. rarely 4. almost never 5. never (.91, .85, .89)
 He thinks the employees have no right to question his actions: 1. always 2. usually 3. occasionally 4. rarely 5. never (.89)
 He puts good suggestions of employees into practice: 1. rarely 2. occasionally

3. usually 4. almost always 5. always.

Table 32

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V1b	10.0	9.2	7.7	-	.71***	5	9.3	1.42	.83
V2b	28.8	26.1	22.3	24.8	.19	11	25.5	6.52	.57
V2c	14.1	15.9	14.8	16.0	.00	6	15.2	3.16	.07
V5b	3.7	3.6	3.6	2.8	.20	6	3.6	.96	.96
V6a	22.0	24.8	23.5	22.3	.41	6	23.1	2.21	.76
V6c	25.0	22.6	23.6	21.4	.44*	6	23.2	2.20	.76
V7c	24.7	24.3	21.9	20.1	.45*	6	22.8	3.23	.80
V7d	23.7	22.4	22.3	-	.00	6	22.8	3.14	.80

In the first three studies listed in Table 32 the dimension was called "Participation." The items given were those used in all except the first three studies where the items were somewhat less homogeneous but similar in kind.

Lack of Pressure for Production

You have heard him urge his subordinates to turn out more work: 1. very frequently 2. frequently 3. occasionally 4. rarely 5. almost never (.76)

You have heard him put pressure on subordinates for greater production: 1. very frequently 2. frequently 3. occasionally 4. rarely 5. almost never (.88)

He emphasizes the meeting of deadlines: 1. very frequently 2. frequently 3. occasionally 4. rarely 5. almost never (.66)

He uses production records to keep subordinates on their toes: 1. a great deal 2. quite a bit 3. some 4. a little 5. not at all (.77)

Table 33

Study	M ₁	M ₂	M ₃	M ₄	ϵ_c	#	M	s	r ₁₁
V7c	16.3	15.6	15.4	14.7	.00	4	15.5	1.75	.73
V7d	15.9	16.3	14.0	-	.56**	4	15.4	1.75	.73

In its original form, this dimension was called "Pressure for Production." The means of criterion groups here have been reversed to conform with the present title. Although a strong relationship appeared with the rating criterion at Lockheed no correlation was present with the production criterion. For this

reason, the dimension cannot be considered as valid without further confirmation.

Organizing

Someone other than your immediate supervisor gives you direct orders: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.85)
 You receive conflicting orders from different persons: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.78)
 You know what job you're supposed to be working on: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.72)
 You have been assigned to do a job only to find that someone else was assigned to do the same thing: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.62)
 There is some question about who is really running your group: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.
 There are days when the work in your group is disorganized: 1. very frequently 2. frequently 3. occasionally 4. rarely 5. almost never.

Table 34

Study	M ₁	M ₂	M ₃	M ₄	r _c	#	M	s	r ₁₁
V5b	4.0	4.0	3.7	3.2	.30**	6	3.9	.72	.80
V6a	24.6	26.3	24.3	22.5	.58**	6	24.4	2.15	.68
V6c	25.4	24.1	25.0	22.9	.22	6	24.4	2.22	.68

Items in this dimension were included in the iterative analyses of both field service and Lockheed journeyman data but the dimension emerged separately only in the latter analysis. In the field service analysis, Organizing and Planning merged into one dimension. The decision was made to report them individually here since they remained separate in one analysis and might do so in further work. We can only speculate why these two variables were more highly correlated in the field service data than with Lockheed personnel. Perhaps both traits are demanded to a greater extent from the relatively autonomous district ranger if he is to be regarded as successful. The less autonomous factory supervisor does not so often engage in planning and organizing activities.

Planning

In planning a job he fails to consider important factors involved: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.84)
 Work time is lost through his poor scheduling and planning: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.87)
 He plans a job before he starts it: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.90)
 When a job is assigned he has made plans to have all the necessary materials on hand: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.78)

When he organizes a job things go smoothly: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.74)
 You know what to do next when an assignment is completed: 1. rarely 2. occasionally 3. usually 4. almost always 5. always.

Table 35

Study	M ₁	M ₂	M ₃	M ₄	ζ_c	#	M	s	r ₁₁
V5b	3.7	3.7	3.1	2.6	.41**	6	3.5	.86	.92
V6a	23.5	24.7	24.0	20.8	.56**	6	23.2	2.49	.77
V6c	25.1	22.6	24.2	21.8	.41	6	23.5	2.34	.77

In the field service analysis where the joint Planning and Organizing dimension emerged from the iterative analysis, the three items which survived were the last item from Organizing, the third item from Planning, and this item: "He lets people get away with violating regulations: 1. frequently 2. occasionally 3. rarely 4. almost never and 5. never. All item-total score correlations were above .88.

Production Drive

It makes him uncomfortable if things don't get done on time: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.68)
 He drives his employees: 1. not at all 2. not much 3. some 4. quite a bit 5. a great deal (.87)
 He expects a great deal from you: 1. never 2. occasionally 3. usually 4. almost always 5. always (.71)
 He puts in more time on the job than is required: 1. never 2. rarely 3. occasionally 4. frequently 5. very frequently.
 He will tolerate inferior work to be a "good Joe:" 1. usually 2. occasionally 3. rarely 4. almost never 5. never.
 He seems to get more than just a "good day's work" from his subordinates: 1. never 2. rarely 3. occasionally 4. usually 5. always.

Table 36

Study	M ₁	M ₂	M ₃	M ₄	ζ_c	#	M	s	r ₁₁
V5b	3.3	3.5	3.2	2.8	.35**	6	3.3	.58	.43
V6a	19.1	20.0	20.3	20.1	.17	6	19.9	1.25	.16
V6c	18.8	19.8	20.4	20.4	.36	6	20.0	1.29	.16

This dimension was originally called "Pressure for Production" in the field service study but the name has been changed here to avoid confusion with a different dimension by that name from the Lockheed V7 study. The same dimension appeared in the Lockheed V6 study as "Compulsion." It will be noted that the trends on this dimension are in opposite directions in the field service and Lockheed data. For this reason, its validity status remains in doubt.

Public Relations

- If trouble develops with someone from the public, he will go directly to that person to try to solve the problem himself: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.77)
- Does he try to avoid having any contact with the public? 1. always 2. usually 3. occasionally 4. rarely 5. never (.80)
- Is he diplomatic in dealing with the public? 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.76)
- Does he seem to run away from trouble involving forest users? 1. frequently 2. occasionally 3. rarely 4. almost never 5. never (.78)
- How much of his time does he devote to maintaining good relations with the public? 1. none 2. very little 3. some 4. quite a bit 5. a great deal.
- How much do people from the public respect him? 1. not at all 2. not much 3. some 4. quite a bit 5. a great deal.
- Does he get angry or sarcastic in dealing with the public? 1. very frequently 2. frequently 3. occasionally 4. rarely 5. never.
- When unpleasant situations develop with forest users, he avoids personal contact with the people concerned: 1. frequently 2. occasionally 3. rarely 4. almost never 5. never.

Table 37

Study	M ₁	M ₂	M ₃	M ₄	c _c	#	M	s	r ₁₁
V5b	4.1	4.0	3.9	3.2	.30**	8	3.9	.77	.93

This dimension grew out of data collected from a critical incident analysis (9) designed to provide hypotheses concerning the reasons for success and failure as a district ranger. The dimension would not be appropriate in a situation where the respondent's superior had no public relations function.

Safety Enforcement

- He tries to see that safety rules are observed: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.80, .83)
- For not observing good safety practices on the job you would be penalized in some way by him: 1. not at all 2. probably not 3. maybe 4. probably 5. definitely (.76, .83)
- He observes the safety rules himself: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.80, .80)

When a major safety rule is broken he is concerned: 1. not at all 2. a little
3. some 4. quite a bit 5. a great deal (.88, .86)

Table 38

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V5b	4.2	4.2	3.9	3.3	.37**	4	4.0	.70	.77
V6a	16.9	16.8	16.7	15.4	.45*	4	16.4	1.20	.68
V6c	16.8	15.9	17.3	15.8	.49*	4	16.5	1.16	.68

Social Nearness

He has close friends among his employees: 1. none 2. one 3. two 4. three
5. four or more (.91, .80, .70)
He "goes out" with the boys in the group: 1. never 2. almost never 3. rarely
4. occasionally 5. frequently (.86, .85, .90)
He has invited you to his home: 1. never 2. almost never 3. rarely 4. occa-
sionally 5. frequently (.83, .59, .78)
He associates with his employees during off hours: 1. never 2. almost never
3. rarely 4. occasionally 5. frequently (.84, .90, .72)
You see him socially after working hours: 1. never 2. almost never 3. rarely
4. occasionally 5. frequently (.70)
He eats lunch with some of his employees: 1. never 2. rarely 3. sometimes
4. frequently 5. very frequently (.60)

Table 39

Study	M ₁	M ₂	M ₃	M ₄	t _c	#	M	s	r ₁₁
V1b	3.4	4.0	1.5	-	.62**	4	3.0	1.67	.26
V5b	3.2	3.0	3.3	2.6	.02	4	3.1	.98	.73
V6a	6.7	7.0	7.1	7.0	.00	4	7.0	1.27	.63
V6c	6.2	7.3	7.8	6.0	.56**	4	7.0	1.19	.63
V7c	13.8	14.1	12.2	13.8	.00	6	13.3	3.21	.77
V7d	14.7	12.2	13.0	-	.22	6	13.3	3.11	.77

The last two items appeared only on the Lockheed supervisor questionnaire (V7). Items for study V1b were similar, although in that study the dimension was named "Social Distance." The criterion group means have been reversed in Table 39 to be consistent with the present title. From the validity evidence presented, it is difficult to draw any conclusion regarding the relationship of this variable to organizational effectiveness. The evidence at least points to

the conclusion that interaction between superior and subordinate at a personal level represents a fruitful area for further investigation.

Sympathy

You have talked over your personal problems with him: 1. never 2. almost never 3. rarely 4. occasionally 5. frequently (.88, .89, .95)

If you had an important personal problem, you would talk it over with him: 1. definitely not 2. probably not 3. possibly 4. probably 5. definitely (.91, .89, .92)

How many of his subordinates ever tell him about their personal problems: 1. almost none 2. a few 3. some 4. many 5. almost all (.68, .87, .88)

He would be sympathetic about your personal troubles if you wanted to tell him: 1. rarely 2. occasionally 3. usually 4. almost always 5. always (.72)

Table 40

Study	M ₁	M ₂	M ₃	M ₄	r _c	#	M	s	r ₁₁
V1b	9.9	7.2	7.2	-	.53*	4	8.1	2.17	.89
V2b	11.9	12.2	10.3	9.5	.15	5	11.0	5.53	.00
V2c	9.4	8.0	7.9	11.0	.00	4	9.1	3.67	.40
V3	22.8	21.2	22.6	-	.42*	6	22.2	1.57	.89
V5b	3.7	3.3	3.1	2.8	.21	4	3.3	1.02	.81
V6a	10.9	11.4	11.6	10.4	.00	4	11.0	1.53	.67
V6c	12.1	11.4	11.2	10.0	.36	4	11.2	1.44	.67
V7c	13.5	13.9	12.9	11.9	.32	4	13.1	1.63	.76
V7d	13.2	13.2	12.4	-	.00	4	13.0	1.67	.76

The items in the first three studies listed varied somewhat from those given; they were less homogeneous, both logically and statistically. The items as given were used in the last five studies.

Discussion. The dimensions presented in this section were more valid generally than those in the area of supervisor self evaluations or situational evaluations. The available data suggest that a positive relationship exists between criteria of organizational effectiveness and the dimensions: Advance Planning, Communication Down, Consistency, Decisiveness, Discipline, Formalization, Good Judgment, Job Competence, Job Helpfulness, Lack of Arbitrariness, Lack of Pressure for Production, Planning, Public Relations, Safety Enforcement, and Sympathy.

As a group, these questionnaire dimensions, and those from the two preceding sections, are regarded as an instrument for measuring important aspects of organizational behavior. Knowledge about the intercorrelations and factorial structure of these dimension will be presented in Chapter III. What these results mean to industrial and governmental organizations and how they may be used will be the subject of Chapter IV.

Chapter III

Dimension Factorial Structure

The iterative item analysis procedures employed in questionnaire refinement resulted in final dimensions which were often found to be intercorrelated. Tables 1, 2, and 3 present the matrices of Pearson correlations between dimensions for the field service, Lockheed journeymen, and Lockheed supervisor data, respectively. In the field service data, intercorrelations were obtained by rescoring the same papers from which the iterated dimensions had been obtained. In the two Lockheed groups, the iterative analysis was performed on one sample of respondents and the intercorrelations among iterated dimensions were obtained from a new sample. The latter procedure is regarded as more acceptable but it could not be applied to the field service data because of the limited number of cases available.

The matrices of intercorrelations in Table 1 and 2 have been factor analyzed by the centroid method (1, 16). The iterated dimensions for the Lockheed supervisors were not sufficiently correlated to make a factor analysis worthwhile. In each factor analysis, four factors were extracted. No evidence of a legitimate fifth factor existed in either case. Oblique rotation to simple structure was carried out in both cases. Tables 4 and 5 give the rotated loadings on the primary factors for the field service and journeyman data, respectively. The corresponding angles between primary factors are shown in Tables 6 and 7.

Three of the four rotated factors seemed to agree rather well between the two analyses. For these three factors, interpretation will be given jointly for the two analyses. The fourth factor in each analysis will be treated separately.

Factor I. Effective Management

Table 8

Rotated Factor Loadings for Factor I

Dimension	Field Service	Journeyman
Safety Enforcement	.70	.73
Planning and Organizing	.74	—
Planning	—	.71
Organizing	—	.65
Formalization	.63	.60
Pride in Work Group	-.01	.62
Discipline	—	.64
Consistency	—	.45
Job Competence	.55	—
Production Drive	.48	—

Table 1

Field Service Correlation Matrix (N = 96)*

Dimension	1	4	5	9	10	12	13	14	16	17	18	19	20	21	h ²	r ₁₁
1. Absence of Dissension															38	88
4. Lack of Arbitrariness	49														87	96
5. Communication Down	41	75													70	90
9. Formalization	28	37	47												69	89
10. Group Unity	27	44	39	24											30	89
12. Informal Leadership	-24	-17	14	-09	-12										25	73
13. Job Competence	32	60	47	52	33	-16									66	94
14. Planning & Organizing	39	55	52	66	25	-24	77								84	80
16. Production Drive	-05	-29	-08	00	01	11	14	18							41	43
17. Pride in Work Group	29	48	48	38	37	-14	37	40	-09						43	75
18. Public Relations	33	69	58	57	32	-19	62	71	-17	35					74	93
19. Safety Enforcement	26	40	37	59	38	-16	53	60	18	21	58				63	77
20. Social Nearness	14	45	43	39	35	-02	36	26	-21	38	48	27			48	73
21. Sympathy	10	50	40	42	35	02	31	31	-18	47	54	31	49		56	81
22. Advance Planning	38	59	59	63	36	-31	82	82	05	43	64	58	24	35		91

* Decimal points have been omitted. Variable 22 was not included in the factor analysis because it failed to emerge as an iterated dimension. Factors loadings for this variable were estimated, however (see Fruchter, B. Introduction to Factor Analysis. Van Nostrand, 1954); for factors I, II, III, and IV respectively, the loadings were .84, .62, .30, and -.61.

Table 2

Journeyman Correlation Matrix (N = 100)*

Dimension	1	3	4	5	6	7	8	10	11	14	15	16	17	18	19	21	h ²	r ₁₁
1. Absence of Dissension																	25	84
3. Communication Down	19																36	78
4. Production Drive	-10	-24															39	76
5. Consistency	24	24	-16														31	73
6. Decisiveness	25	34	-31	05													38	58
7. Discipline	20	34	-10	22	28												46	65
8. Formalization	24	31	01	21	09	43											40	73
10. Group Unity	19	35	06	27	-07	20	27										50	59
11. Informal Leadership	-02	15	11	07	-18	04	20	39									38	66
14. Lack of Arbitrariness	27	38	-43	21	32	26	15	16	07								56	62
15. Organization	22	-28	-16	18	26	30	24	01	-20	29							52	63
16. Planning	36	29	-24	47	35	56	40	38	11	53	46						77	81
17. Pride in Work Group	45	24	-08	44	15	34	36	43	23	35	33	58					59	70
18. Safety Enforcement	41	30	-12	50	25	58	46	25	-02	34	26	61	50				58	82
19. Social Nearness	-13	16	08	-07	-03	-04	10	17	23	02	-16	12	16	02			45	67
21. Sympathy	02	03	01	14	07	14	25	22	27	32	-16	19	33	15	37		30	79
22. Good Judgment	38	31	-34	35	32	47	34	16	01	45	41	70	41	58	02	02		67

* Decimal points have been omitted. Reliabilities given here and elsewhere in this report were obtained by correcting split-half correlations for doubled length by the Spearman-Brown formula (15). As such, these reliabilities are estimates of internal consistency and frequently may be serious underestimates of the actual proportions of true variance. Estimated loadings for variable 22 (not included in the factor analysis) on factors I, II, III, and IV, respectively, were .72, .57, -.10, and .04.

Table 3

Supervisor Correlation Matrix (N = 100)*

Dimension	1	2	3	4	5	6	7	9	11	12	14	16	17	18	19	20	21	22	23	24	r ₁₁
1. Adequate Authority																					75
2. Adherence to Regulation Work Patterns	32																				73
3. Attitude Toward Paper Work	48	36																			91
4. Avoidance of Unpleasantness	-17	-05	-31																		48
5. Communication Down	39	11	20	-15																	77
6. Confidence in the Company	37	25	32	-14	38																69
7. Democratic Orientation	06	-04	-10	29	07	19															40
9. Global Planning	14	22	18	-07	16	06	07														57
11. Human Relations vs. Production Centered	04	05	-01	-03	07	22	12	04													03
12. Influence with Superiors	22	24	37	-22	34	37	-08	16	04												48
14. Lack of Arbitrariness	40	24	36	-20	31	21	04	12	-09	20											72
16. Non-Hypocritical Attitude Toward Subordinates	18	22	28	-18	01	15	11	11	-07	13	01										60
17. Lack of Pressure for Production	35	18	36	-06	10	14	18	02	-02	03	21	17									94
18. Pride in Work Group	36	25	19	-12	36	46	03	18	14	19	28	21	07								71
19. Reserve	-03	-20	00	-11	04	02	-15	09	10	-03	02	-18	-12	-09							60
20. Self Improvement	22	10	24	-27	31	32	19	08	20	17	14	-17	-04	28	05						88
21. Social Nearness	05	-09	-05	00	25	12	11	-10	03	-04	09	-16	16	21	-04	10					70
22. Sympathy	09	17	07	-06	22	23	30	10	13	15	-08	05	-17	34	-06	26	35				62
23. Urgency	-18	-14	-12	14	12	-02	09	04	20	-25	-15	-07	-34	05	17	09	-12	07			40
24. Good Conference Practice	42	29	42	-24	34	25	-08	-02	-01	18	57	22	-30	44	-03	10	11	34	-06		72
25. Job Helpfulness	50	64	51	-30	44	44	-01	07	00	32	60	17	-25	50	-12	27	13	18	-15	67	82

* Decimal points have been omitted. Dimensions 24 and 25 were not iterated dimensions.

Table 4
Primary Rotated Oblique Factor Loadings
Field Service Data

Dimension	I	II	III	IVb
2. Absence of Dissension	.08	.57	-.24	-.28
4. Lack of Arbitrariness	-.11	.79	.07	-.42
5. Communication Down	.00	.84	.00	.03
9. Formalization	.63	-.12	.58	.04
10. Group Unity	.04	.39	.18	-.02
12. Informal Leadership	-.15	.05	.00	.43
13. Job Competence	.55	.45	.00	.02
14. Organizing and Planning	.74	.36	-.03	.00
16. Production Drive	.48	.13	-.41	.57
17. Pride in Work Group	-.01	.51	.20	.00
18. Public Relations	.34	.12	.51	-.34
19. Safety Enforcement	.70	-.06	.37	.03
20. Social Nearness	-.03	.12	.61	-.10
21. Sympathy	-.01	.06	.71	-.06

Table 5
Primary Rotated Oblique Factor Loadings
Journeyman Data

Dimension	I	II	III	IVa
1. Absence of Dissension	.39	.08	-.14	.17
3. Communication Down	.01	.47	-.07	.31
4. Production Drive	.17	-.66	.35	.04
5. Consistency	.45	.01	-.11	.28
6. Decisiveness	.06	.58	-.01	-.30
7. Discipline	.64	.07	.33	-.20
8. Formalization	.60	-.08	.41	.02
10. Group Unity	.34	-.11	.12	.59
11. Informal Leadership	.05	-.13	.27	.47
14. Lack of Arbitrariness	.08	.70	-.08	.05
15. Organization	.65	-.08	-.12	-.29
16. Planning	.71	.27	.11	.03
17. Pride in Work Group	.62	.06	.12	.31
18. Safety Enforcement	.73	.08	.09	.03
19. Social Nearness	-.08	.12	.64	-.03
21. Sympathy	.07	.19	.41	.11

Table 6
Correlations Between Primary Factors
Field Service Data

	I	II	III	IVb
I	1.00			
II	.33	1.00		
III	.14	.66	1.00	
IVb	.37	.11	-.08	1.00

Table 7
Correlations Between Primary Factors
Journeyman Data

	I	II	III	IVa
I	1.00			
II	.47	1.00		
III	-.17	.15	1.00	
IVa	.08	.24	.43	1.00

In Tables 8 through 12 are listed the variables for which the factor loadings were .40 or more in at least one of the two analyses. In the field service iterative analysis, Planning and Organizing merged into one dimension while in the journeyman analysis they remained separate. When a dash (—) appears instead of a factor loading for a given dimension, it indicates that the dimension did not appear in the analysis.

The factor represented here has been named "Effective Management" because of the relatively high correlations with the more technical aspects of the supervisor's job. Pride in Work Group failed to appear with substantial loadings in the field service analysis but the agreement otherwise is good.

Factor II. Consultative Supervision

Table 9

Rotated Factor Loadings for Factor II

Dimension	Field Service	Journeyman
Lack of Arbitrariness	.79	.70
Communication Down	.84	.47
Production Drive	.13	.66
Decisiveness	—	.58
Pride in Work Group	.51	.06
Absence of Dissension	.57	.08
Job Competence	.45	—

Agreement between the two analyses here is fairly good for the two top variables, but Production Drive, Pride in Work Group and Absence of Dissension fail to agree in both analyses. In the Forest Service these two variables seem to relate more to Consultative Leadership whereas in the case of journeymen, they were more related to the supervisor's technical competence.

On the basis of the evidence, it would seem that the factor might best be given the title "Consultative Leadership" in that the two principal dimensions loaded in both factors are concerned with the extent to which the supervisor brings his subordinates into the picture by taking their feelings into account and letting them know what is going on.

Factor III. Familiarity with Subordinates

Table 10

Rotated Factor Loadings for Factor III

Dimension	Field Service	Journeyman
Social Nearness	.61	.64
Sympathy	.71	.41
Formalization	.58	.41
Public Relations	.51	—
Production Drive	-.41	.35

The first two variables listed suggest that this factor is concerned with the extent to which supervisor and subordinate develop a rather personal relationship. The appearance of Formalization does not fit in too well with this hypothesis, but since neither of the two principal dimensions on this factor has any loading of consequence elsewhere, they have been allowed to dominate the factor interpretation. Both Social Nearness and Sympathy indicate a relationship between subordinate and supervisor which goes well beyond that necessary to the transaction of organization business.

Factor IVa. Group Cohesiveness

Table 11

Rotated Factor Loadings for Factor IVa

Dimension	Journeyman
Group Unity	.59
Informal Leadership	.47

This factor seems to be concerned mostly with the existence of active organized behavior within the work group which is not initiated through the supervisor. It is perhaps not surprising that such a factor should emerge from an industrial organization in which workers belong to a union. Behavior of this kind is much less prevalent in a civil service type of organization, which perhaps accounts for its failure definitely to appear as a factor in the field service analysis.

Factor IVb, Forceful Supervision

Table 12

Rotated Factor Loadings for Factor IVa

Dimension	Field Service
Production Drive	.57
Informal Leadership	.43
Lack of Arbitrariness	-.42

The items for Production Drive suggest this factor is likely to be concerned with that kind of leadership which is characterized by a great deal of drive but very little tact. Such a leader may set exacting standards for himself and his subordinates. A leader of this kind may have one or more subordinates of long standing who exercise influence in the group because of their favored position with the supervisor.

An interesting comparison in these two analyses is that for the variables Pride in Work Group and Absence of Dissension. It will be seen that these variables are associated with the human relations variables (Factor II) in the field service analysis while in the journeyman analysis they are associated principally with the effective management variables (Factor I). This will perhaps serve to emphasize the obvious fact that all these dimension variables are apt to vary from one organization to another in their relationships to one another and to criteria of organizational effectiveness. Thus, the type of supervision which will succeed in one situation will not necessarily be appropriate in other organizational settings.

The conditions which prevailed for these two analyses were not too favorable for good factor identification. The dimensions were constructed and purified by the iterative technique for the purpose of rendering them as independent of each other as possible. A comparison of the communalities and reliabilities in Tables 1 and 2, for example, shows that much of the variance in these dimensions remains specific as far as these matrices are concerned. Only to the extent that the objective of dimension independence could not be achieved did correlations reliably different from zero appear among the final dimensions. Factor analysis cannot proceed except as correlations different from zero exist among the variables treated. The use of factor analysis here, then, has been to analyze unwanted common factor variance among dimensions. In designing a factor study to locate and identify the factors in a given domain, however, we should really be trying to maximize the common factor variance rather than minimizing it. We would deliberately include several variables to measure each factor instead of trying to avoid doing so. For this reason, the factor analyses presented here are better suited for assessing the existing relationships among dimensions than for revealing the underlying factorial structure of this domain.

Chapter IV

Implications for Management

Results have been given so far with very little interpretation or descriptive material. The first objective of this chapter will be to provide a non-technical description of those characteristics of organizations and supervision which our studies have shown to be indicative of effective organizational behavior. The second major objective of this chapter will be to suggest how the results of this research may be put to use by management.

The first three sections of this chapter will be devoted to descriptions of behavior measured by the valid dimensions given in Chapter II. The same classification of dimensions used in that chapter will be followed here. Section one will be concerned with those behavior dimensions which are measured through questions which supervisory personnel answer about their own feelings and behavior. Section two will treat those dimensions concerned with characteristics of the situation and the people in it, as determined by questions asked of respondents at the lower supervisory and nonsupervisory levels. Section three will treat those dimensions which measure the supervisor's behavior by means of questions asked of his subordinates.

Supervisory Self Evaluation

The dimensions of this type which can be rated as having a strong probability of validity are Adequate Authority and Non-Hypercritical Attitude Toward Subordinates. The latter would seem to have more application to higher supervisors than to lower ones. Those which have a trend toward validity are Favorable Attitude Toward Paper Work, Backing Up Decisions, Confidence in the Company, and Lack of Job Security Consciousness. A brief description of item content in each of these dimensions follows:

Adequate Authority. Supervisors in the more effective subunits feel that their superiors do not make decisions which they should make themselves. They are not conscious of irritations occasioned by the necessity of getting approval from above. They feel that they have enough authority to handle emergency decisions themselves.

Non-Hypercritical Attitude Toward Subordinates. The better supervisors say that they practice general rather than close supervision; they say that their employees do good work; they would replace few of their subordinates; they believe that their people put forth adequate effort; and their subordinates seem to them to be competent.

Favorable Attitude Toward Paper Work. Paper work is not regarded as an undue burden by good supervisors; they look at the reports and records which they prepare as necessary and useful.

Lack of Job Security Consciousness. The supervisors of more effective units would give little weight to seniority in selecting personnel; they have little

weight to seniority in selecting personnel; they have little hesitancy in dismissing an inefficient employee; they believe in merit evaluation of employees; and they prefer a job with opportunity over one with seniority.

Backing Up Decisions. The supervisors of more effective work groups feel confident of support from higher administrative echelons. Because of this they are able to make decisions without fear that their superiors will not back them up.

Confidence in the Company. The supervisors of the better units believe that their organization is better than others in the same line of effort; they think it is more efficient, has superior top leadership, and is a preferred place to work.

Situational Evaluation

Only Pride in Work Group and Good Conference Practice exhibited definite and consistent validity in this group of dimensions. Absence of Dissension, on the other hand, has shown some in experimental validity and has a good deal of logical validity to back it. One possible reason why this dimension did not prove valid in many studies is that it measures the kind of behavior which cannot be tolerated for long in an organization without serious consequences. If we assume, therefore, that little variance on this dimension usually exists, validity would not be demonstrated. These considerations have prompted a tentative inclusion of this dimension pending more conclusive evidence.

Pride in Work Group. Members of an effective work group are more likely to become angry at a fellow worker who does not do a good job. They take pride in the group's work record and are more likely to tell friends that it is a good outfit. They say that they would rate their group high as compared to others, and would rather work there than anywhere else.

Good Conference Practice. Effective groups experience more widespread participation of members in group conferences. The meetings which they attend are more likely to deal with matters of interest to them. Such gatherings are characterized by a friendly spirit, and people are not hesitant to speak up in opposition even when their own supervisors chair the meetings.

Absence of Dissension. In the less effective groups there are more people who refuse to speak to each other and who bear a grudge toward one another. Among them is also more animosity and bad feeling of group toward group; grudges are held longer and quarrels are more evident.

Evaluation by Subordinates

A larger number of dimensions achieved high significance where workers were evaluating the behavior of their own supervisors than for dimensions in the two previous sections. These dimensions may be classified into two broad categories: (1) those whose main connotation centered around organization and management; and (2) those primarily oriented in "human relations." The appar-

ently valid organization and management dimensions were Planning, Advance Planning, Organizing, Formalization, Job Competence, Discipline, Consistency, Decisiveness, Good Judgment, and Influence with Superiors. Valid dimensions falling in the human relations category were Communication Down, Job Helpfulness, Lack of Arbitrariness, Public Relations, and Sympathy.

Planning. The good hierarchical leader plans a job before he starts it and then lets each person know his duties and responsibilities. He considers all important factors in advance, he sees that the necessary materials are on hand when needed, and he makes schedules. He sees beyond the immediate problems of today and makes plans for exigencies which are likely to arise in the future. He flattens out peak periods by spacing the work properly.

Advance Planning. This second planning dimension is different from the first in degree rather than in kind. It emphasizes the future rather than current scheduling and production planning. The better hierarchical leader is one who definitely perceives possible future emergencies, needs and exigencies and who does something to prepare for them.

Organizing. The effective leader so conducts himself that his superiors do not find it necessary to give orders and directions to his people. He establishes clear-cut lines of authority, avoids giving conflicting orders, and lets people know specifically what they are supposed to do. He takes charge in such a manner as to leave small doubt as to who is the leader, and functional specialists have little need to interfere in his bailiwick to correct malfunctioning.

Formalization. The good supervisor in a fairly autonomous situation furnishes his subordinates an up-to-date organization chart and written job descriptions. He also writes out job orders and instructions. He likes to have work plans written down, he provides employees with copies of rules and regulations, and makes available copies of standard practice procedures.

Job Competence. It has long been a matter for recurrent discussion whether the good hierarchical leader needs to be able to do the work performed by those whom he supervises. These studies show that immediate supervisors in forests and aircraft factories are more effective if they are competent in the performance of the work done by their subordinates. They can show others how the work should be done, solve production problems involving technical "know how," and suffer a minimum of failure due to lack of knowledge.

Discipline. The effective supervisor does not avoid taking disciplinary measures when the occasion demands; he will not permit people to get away with violation of regulations; he can be firm in dealing with people when necessary; he will not put up with poor work in order to avoid disciplining a subordinate.

Consistency. The strong leader administers equal justice to all, playing no favorites. People know what to expect of him and have confidence that he will do what he says he will.

Decisiveness. The evidence here indicates that "poor" supervisors are rather cautious. They are reluctant to stick their necks out, they put off making important decisions, and sit tight during tense situations. This kind of behavior is less evident in "good" supervisors.

Good Judgment. Better supervisors are regarded by their own subordinates as being good decision makers. They do not make costly mistakes and their decisions do not result in wasted effort.

Influence with Superiors. The better supervisor can influence his superiors to make decisions in favor of his subordinates. He can get wage increases and other benefits; his people believe that his decisions will be backed up by topside (14).

Communication Down. This is the first of the "human relations" dimensions mentioned earlier in the chapter. Results from this dimension suggest that the good supervisor passes on information employees would like to have; he lets them know where they stand with him; he tells subordinates about information he has received from above.

Job Helpfulness. The good supervisor seldom is impatient with an employee who asks for help; he often goes out of his way to help someone with a job problem; he takes time out to secure information needed by someone; and he is willing to show how to go about a new job when asked.

Lack of Arbitrariness. The good leader is likely to be willing to listen to ideas from below; he tolerates those who disagree with him; questions do not irritate him; and he puts meritorious employee suggestions into practice.

Public Relations. The only study in which face-to-face public relations constituted a vital part of supervisory behavior was that dealing with the U.S. Forest District Rangers. The results were so highly significant for evaluations of rangers by their subordinates that the dimension would seem appropriate wherever supervisors have contact with the public. In dealing with difficulties concerning persons outside the organization, the supervisor should not run away from trouble, but should go directly to the disaffected person and try to settle the problem through face-to-face dealings. He should not get angry or sarcastic when talking to people, but should practice tact and diplomacy at all times. He should arrange his affairs so that the required amount of time can be devoted to external affairs as distinguished from internal management. He should not rely upon written communications as substitutes for personal contacts, especially in matters which might involve tension and misunderstanding.

Sympathy. The effective supervisor is a good counselor. His people feel free to approach him for the purpose of discussing personal problems, and many of them do go to him for this purpose. In such cases he creates the feeling that he is really interested and sympathetic.

Practical Applications

The first thing which should be emphasized is that only those dimensions which have some claim to experimental validity have been discussed in this section. In other words there is a presumption backed up by statistical evidence that they represent desirable behavior in at least some organizations.

Assessing Organizational Effectiveness. The representative of management

who wishes to apply the results of this research in the evaluation of his organization should select the dimensions to be used from those discussed in this chapter. Then he should turn to Chapter II and lift the desired items for each dimension, arranging them in a questionnaire. Items for a given dimension should be scattered throughout the questionnaire. It is expected that most of the dimensions mentioned in this chapter will be used in any given instance. A different questionnaire should be developed for nonsupervisory and supervisory personnel. The questionnaires may be administered to all appropriate personnel in the organization, or to a randomly selected sample.

Analysis of Responses. A simple way to summarize a person's responses is to obtain his total dimension scores. For our validation studies this was accomplished by weighting the responses on the continuum for each item from one to five. A person's dimension score, then, was merely the sum of the weights for the responses he gave to those items. The means on each dimension for the organization as a whole will furnish clues as to strength and weakness. They will provide a basis for such judgments as: "We are low on Communication Down"; "Some attention needs to be given to Planning"; or "We had better start some training on counseling and Job Helpfulness." Of course, it would be highly desirable to have norms on these dimensions for a wide variety of organizations. Data of this kind are limited at present to those given in the tables in Chapter II. Where no normative data are immediately available, inferences must be drawn from knowledge of the maximum possible score in relation to the obtained average, variability, and knowledge of conditions affecting these statistics.

At Lockheed summary information was expressed in percentages. If the responses are weighted from one to five, as they were in figuring the means, the maximum possible item score is five. Lockheed computed the mean for each dimension by adding maximum item scores for all items on the dimension; from that, Lockheed's total dimension scores were converted to percentages of the maximum possible dimension scores. Thus, if the mean of the responses was 16.0 and the maximum possible was 20, the score was 80 per cent. An example of graphical presentation of such results is given in Figure 1.

Leaders of subunits can be evaluated by examining their self evaluation dimension scores and averages of their subordinates' supervisor evaluation dimension scores. Such data may be used for counseling and for stimulating personnel development. Supervisors can be shown their points of strength and of weakness and may be advised as to how to correct deficiencies.

Training. Data obtained from the dimension analysis may provide a source for determining where training needs lie. Training outlines and manuals should be examined to see whether they are giving sufficient attention to the content areas suggested by these dimensions. The questionnaires originally administered may be given again following a period of training to determine if the desired effects are being achieved. Several satisfactory statistical designs could be applied for this purpose. A simple procedure would be to survey all personnel in a given group prior to and following training. Differences in mean dimension scores before and after training may be evaluated statistically to determine if they exceed chance expectancy.

A Final Word. The authors make no claims that the findings presented here will be universally valid. They do represent our most educated guess based upon

a series of questionnaire studies in an area of knowledge where universals are difficult to come by. If we have had a bias in our approach to this field, it is that objective methods should be employed to as great an extent as possible. Our methods have perhaps sacrificed something in flexibility in the attempt to achieve greater objectivity, but in such an unstructured domain, we feel the sacrifice has been not only worthwhile but perhaps even necessary. Without objective procedures, self discipline is probably not sufficient to safeguard the investigator against unconscious desires to "prove" preconceived notions.

The results of this four year project have certainly pointed toward the necessity of integrated series of studies rather than isolated efforts if the maximum progress is to be made. Where so many variables cannot be controlled, valid relationships can emerge only on a probability basis. No one study of the kind conducted here can very strongly confirm or refute a given hypothesis in this area. It is our sincere hope that the series of studies presented in this final report will represent a worthwhile advance in our knowledge of the factors related to organization effectiveness.

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